



**In the Name of God
the Beneficent, the Merciful**

We verily sent Our messengers with proofs,
and revealed with them the Book and the Balance that mankind may observe right
measure; and He revealed iron, wherein is mighty power and (many) uses for mankind, and God may know him
who helped him and His messengers, though unseen.
Verily, God is Strong, Almighty

(Holy Quran, 57:25)

ENDOGENOUS DEVELOPMENT

A MODEL FOR THE PROCESS OF MAN-ENVIRONMENT TRANSACTION

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DECLARATION

Except where otherwise acknowledged this dissertation is entirely my own work.
Seyyed Gholam Reza Islami

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ABSTRACT OF THE THESIS

Iran is currently subject to a number of adverse factors affecting good development in the built environment: population explosion, oil-dependent economy, finite resources, war and natural disasters, etc. The object of the study is to research a development model appropriate to the Country's needs for a proactive system of building environment. This model is not specific to Iran and, as the case studies and the discourse of the thesis indicate, is universal. However, the author suggests that the validity of development approaches will not be determined as a result of theoretical and ideological debate but in the realm of practice. Therefore, he has explored diverse ways in which professionals in the built environment can provide an analytical survey of the problems that beset them. An attempt has been made to bring these various elements into perspective and offer a model of 'endogenous development'.

The process for achieving a viable, exciting and humane built environment is very complex and calls for contributions from many individuals and small multi-disciplinary groups. Beside professionals contributions (which is accomplished by deduction inference), there is a need for people's participation in design process (which is accomplished either by deduction or by abduction inferences). This participatory approach can also help shifting the process of design towards a wider domain than that of the 'production process' (which is accomplished by abduction and induction inferences). Production process is the first paradigm of the model of endogenous development and is a manifestation of a feedback mechanism and acts as an open-ended living system. The second is 'supply-demand' paradigm which shows the relationships between the components of a system or between different systems in surface-structures.

This model is directed at society's development, not just its economic growth, but it does not preclude the possibility of such growth. The reduction of the problems' effect in an endogenous development is viewed more as a way of improving the quality of life than of increasing the standard of living. Nowadays, people are passive recipients in the consumer society and are totally dependent on others for their survival. This style of living is assumed to project an image of economic development and higher productivity, but there is a confrontation of preadjusted commodities which are the products of others. That is because the process of production is not natural (i.e. a closed loop cyclic process via feedback control). It is artificial (i.e. an open-loop linear process via a feed-forward control) which may not help satisfying the user's needs and wants entirely. In the built environment, the great majority have no say in the planning and design of their homes or places of work.

Accordingly, endogenous development offers a framework within which the necessity of employing the people's creative power in building their environment is explained. It is based on the assumption that each individual and society's knowledge and experiences play a central and mediating role between professionals' perceptions of the environment and a series of preferences judgements or choices they might make towards and within that environment. Indigenous knowledge and cultural attributes of traditional societies and the organizational capabilities of traditional polities are essential in qualification of the development plans, which are also evaluated and assessed by this proposed framework.

PREFACE

All Adam's race are members of one frame,
Since all, at first, from the same essence came.
When by hard fortune one limb is oppressed,
The other members lose their wanted rest.

(Sa'di, 13th Century Persian Poet)

The word 'endogenous' is originally a botanical term. An 'endogen' is a plant that increases by the growth of new vascular and cellular tissue irregularly among that tissue already formed (We, 1994). Endogenous means originating on or growing within the side of something, as cells within the wall of the parent cell. Webster's dictionary just says 'originating or produced from within'. That seems a good metaphor for development and its economic and technological growth. The same source indicates that it is definitely not how an economy grows, or innovations develop. It is a view of society as a giant organism within which innovations develop randomly and irregularly, not in any planned manner. But, the thesis is to suggest that 'endogenous development' is not processing randomly, its homeorhesis (stability) and homeostasis need regularity and planned manner.

Epskamp (1992, p.17), in his book which is about endogenous cultural development, states: "... the adjective 'endogenous' is different from 'indigenous', because the first is more connected with the cultural identity of a society which clarifies itself by its nationhood, whereas the second term points to a society which characterises itself by its shared culture." The definitions share an existing cultural identity which relates to Epskamp's main thesis that unless development workers understand the cultural identity and specific conventions of the tradition of the people whom they are addressing, alienation rather than communication can result. He pinpoints another fact in page 244 of the same source and asserts: "No matter what change you are trying to bring about, the intervention must be translated into the culture of the people you are operating with, if it is to acquire credibility in their eyes."

The necessity of knowing the development problems requires new programmes and organizations, therefore, the author's concern is about knowing both 'endogenous development' and 'endogenous growth' which are considered to be employed in a model

discussed in the thesis. For instance, there are not enough equipment and essential bases for explosion of population in the South and the direction of national strategy and centralization of decision making concerning political and economical dependency has made their societies gradually change from an essential programme in development into a threatening problem nationally. The gravity and confusion of urban organization in these countries, will be more evident when one puts quality of distribution and dispersion of population in the habitats and the structure formation of environmental systems is examined. There is a metropolis with no conjunction in all the different stages to the other cities and accumulation of activities and wealth in most of these countries. Connecting the national economy to international capitalism disregarding its own cultural background has caused the growth of the habitats to change from an independent and endogenous state into a dependent and exogenous state resulting in a national metropolis¹.

Endogenous growth theory can be seen as a criticism of globalization. Traditional neo-classical models of economic expansions explain that growth originates from trade. As Gill et al. (1988, p. 233) find: "Liberal economists have interpreted the association as one where causation runs from freer trade to faster trade growth to faster economic growth." It means that the export-driven development will trickle down to all parts of the economy and eventually all countries will be at the same level (We, 1994). Therefore, what endogenous theory does is to show how countries can work within the process of globalization, to find complementary activities, such as education and retraining, and regulatory frameworks which help them survive and modify their relationships with the multinational corporations within their political and economic boundaries. Therefore, endogenous growth theory offers hope to Newly Industrialising Countries (NICs) and alternative ways to develop without becoming dependent on trade. We (1994) states that traditional theories of growth focus on trade as the engine of growth; endogenous growth theory focuses on education, on-the-job-training and development of new technologies for the market.

With the rise of affluence in this century, attention has shifted increasingly from minimal to

¹ Tehran is such a metropolitan and Iran's capital city with the population of almost seven million (the last National Census in Ettela'at No. 668, 1997) plus nearly two million who migrate daily to the city for work.

more optimal standards, from production to more consumption. With this concern, the problem of industrialisation and specification developed and created so many pressures. These pressures are aggravated in places such as Iran where natural disasters or wars imposed special constraints on the process. However, with the social ferment of recent years, it has become increasingly clear that development programmes can no longer ignore the fact that the general population of the world is made up of numerous nations with different cultural identities and a number of interests.

Determining this concept should lead professionals towards gaining a relevant world view of building environment. This world view then will guide them to pursue the main problem which they are facing in the field. Therefore, the primary concern of the thesis is the model of 'endogenous development'. This is not problem oriented thesis to focus on a specific problem of a specific case study. Therefore, it does not attempt to prescribe solutions for those problems. The main focus is on the theories which have been propounded, as literature. But, it opens out a new discourse and opportunities for professionals to do so. In fact, the thesis is talking to scholars and propounds questions instead of respondents which is of course the nature of the discourse.

The author's attempt is to develop a model which may simulate long run developments programmes. Such models serve a purpose in evaluating the implications of the concepts, designs and plans before they are implemented. This line of work brought to the attention of the potentiality of existing resources in regions and the reliability of the people's participation programmes. The proposed framework has also consequences for planning and design assessment, evaluation and management. In this regard, the thesis's goal is to answer the questions like 'what' is the meaning of endogenous development, in 'which range' of categories can be fitted this kind of definition of development, 'how' can the processing of this concept happen, 'who' are its main generators, 'when' is the appropriate time for its implementation, through 'which condition' and to 'what extent' one can guarantee its results and so on.

At this time it seems that there are no research approaches to questions of this kind, nor does the model presented in this thesis provide any immediate answers. The concern here is with

outlining an approach to the study of lifestyles of people who want to have an independent (of external aids) and sustainable life using their own resources; identifying differences in development plans and strategies, especially for those aspects of everyday life which relate to the living qualities of their built environment; and deciding what kinds of factors are associated with the proposed model.

To bring out another way of thinking about the purpose of this thesis, it is worthwhile to focus more directly on the attention of recent development plans emphases and be more pointed about what is a glaring omission in the practice of the different disciplines. An inspection of the output from different agencies (governments or private sectors) across the world, which has been done by building up a discourse and bringing out supportive practical schemes, indicates a strong preoccupation with the supply side of the picture and a relative insensitivity to users of space whom these programmes are predominantly intended to serve. Although there has been a long tradition of dedication to the public interest, and much is being said these days about community goals and people's participation, especially in design process, these emphases appear to project a perspective about residents of a metropolitan areas as though they were homogeneous in their lifestyle and value orientations.

In short, the concern of this thesis is about an approach to understanding the diversity of development plans to be found in the built environment disciplines, with the notion of subsequently bringing this knowledge to bear in designing the future. Given this kind of approach, the next step would be the development of measures of user demand as it differs from the designer's perception of users demand and needs. But, since user demand and user satisfaction with present opportunities and user preferences and expectations about changes in the future can be expected to vary with the life style, the first step involves the development of a base of understanding about life systems. The work outlined here is designed to provide a beginning in developing such a base of understanding.

But, how does this idea, for supporting the indigenous communities and institutions, fit into the long string of theories and definitions? Investigating the roots of development theories and strategies in philosophy, logic, and science, the author concentrates on the mechanism of

change which can be implemented either by a comprehensive plan intentionally designed to emerge from within or can be imposed from without by an undesirable situation or an external constraint. Therefore, the emphasis of the thesis is about those who reside in the local areas or villages created by the natural processes, an aspect of the producer side of the picture. For this, not only is there a concern about cultural preference and structural process in the built environment, but also living quality and social equity, the result of organizational issues in public and private sectors. Such questions as how it is possible to identify the paradigms embodied in the traditional way of life for enabling professionals to organize or to revitalise their societies become very relevant.

Two important stimuli were involved in this research: one is the question which the author asks himself from the beginning of the triumph of Islamic Revolution in Iran. That is why people's power is so efficient in determining a regime in the political level, but it is not strong enough to develop the future of the Country. The second question started from 1978, the beginning of Islamic Republic of Iran, when all the built environment professionals began to seek a new philosophy and world view to cope with the problem of dramatic changes in the Country or to propound new scope for the development. This movement was extremely popular in the faculty of architecture where some of the author's colleagues started to magnify the validity of the traditional works by more description and explanation. Therefore, the thesis's attempt is to investigate the ways led to appropriate answer to these questions or to push the idea one step further, so that to make some of the ideas resulted from the discussions about the values of tradition applicable.

In the beginning of the Revolution, professionals were astonished by people's achievements. But afterwards, they adopted a role in reconstructing the damages occurred after the changes in politics; and the damages of war between Iran and Iraq (1979-1987). The more specialisation and specification of the work emphasised by the professionals, the less success was achieved in the factual work. Therefore, the reasons for the success of the people in harsh situation and the failure of the experts from one hand and the need for seeking a way to be able to use the people's potential power for redesigning and revitalizing their society became a matter of the author's interest which gives soul to the present research.

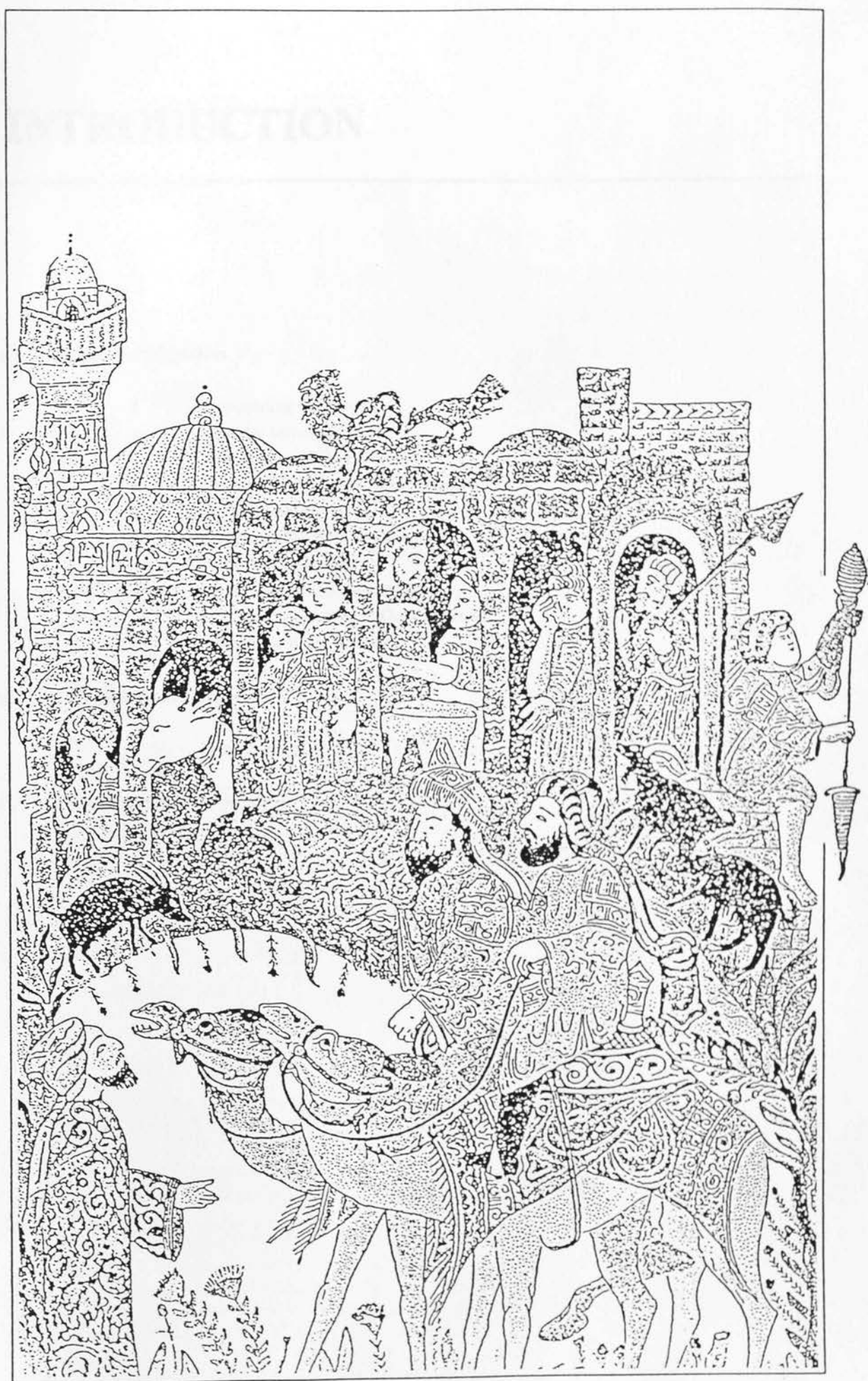
Moreover, the topic 'endogenous development' has been approved officially by a committee, in the Ministry of Culture and Higher Education of Iran, according to the needs of the Country and considering the author's desire and capability. So, there are three constraints to do this research: first, the client 'wants' or the necessity of the thesis for the real needs; secondly, the nature of the topic itself which is to search for a new concept in development discourse and finally the nature of a Ph.D thesis which is not problem oriented and prescriptive. This is because the author assumes that students are in the process of learning to be professional, therefore, they need to have efficient tools to investigate problems and search for their causes. It is conceivable to suggest that the literature about the subject, our background knowledge and the data from the survey are the main resources of the study (i.e. A, B, and C in Figure 6). But, the proportion of using the mixture of them is depended on the above constraints. Accordingly, the author aims to describe, explain, simulate and evaluate the model of endogenous development.

To be able to achieve some of these goals, three parts are suggested for the thesis. Part One includes a discourse about the problem of the relation between Man and environment with emphasis on the role of designers and planners. This is more focused on design process than the other matters. Part Two is an attempt to analyse the mechanism of this process using scientific, logical and philosophical arguments to be able to build up a model for endogenous development which is about productivity and its application in artificial domain. In this discussion, one can see the linearity of industrial production and cyclic process of natural production which help understanding two paradigms of endogenous development. Two approaches have been employed to explain their functions. One is a system view which yields opportunities to compare feedback and feed-forward controls and their roles in creating a 'supply-demand' relationship between products in a synchronous domain. The second is structuralism which traces the roots of a 'production process' in diachronous domain. Finally, Part Three has been designed to bring empirical experiences from the case studies to support the suggested model. This part uses an inductive approach in order to support and identify criteria for testing the model. Four supportive case studies, which have been chosen because of their contribution to people-centred development as opposed to economic growth or other form of development, and a questionnaire, which aimed to go deeper into the respondents'

cognitive structure using an open-ended format, are conducted in this part.

The approach which is followed in this research is to start from problems, as they have arisen in the various relevant discourse about the topic, to show the necessity of the endogenous development model and to develop it in more or less detail in a selection of illustrative examples. Such procedure will present a rigorous development of theory while the author has tried to support the model with scientific theories and philosophies. It is, however, his experience that such panoramic view presents to the student a suitable introduction into a new way of thinking which is eagerly and even enthusiastically accepted; and offers to the scholar a starting point for further work. The latter is testified by the large number of investigations which drew their inspiration from the bases which formed the present work. The title 'endogenous development' accurately outlines a new scope of development. Some chapters deal with the essential theory and the working tools of regional planning, of which seems to be too little knowledge between most designers and planners. In particular, it tries to redirect the consideration of professionals and agencies towards the values embedded in traditional ways of building an environment by 'people's participation'.

To carry out such a vast research requires knowledge of many disciplines and access to sources in many languages. The author does not, by any means, claim to possess a mastery of all of these domains nor of all the languages involved. Because of these reasons as well as the limited time at his disposal for the preparation of this thesis, he has often made use of secondary sources. In fact, most of the notes, excluding those which serve as reference, are meant to be additional support for the thesis's arguments and not their scholarly proof. In the notes that he has not sought to exhaust the sources that substantiate his position nor to provide all the scholarly proofs necessary to convince all the readers but to provide certain evidence and to point out the way for further investigation by others. The author hopes that the ideas presented here will stimulate some thinking in a constructive direction toward the solution of a problem of development that is both urgent and vital and will not simply be brushed aside by the would-be critics because of lack of full historical and scholarly evidence, a role which these essays have not been meant to fulfill.



INTRODUCTION

A. Aims and Objectives

- Propounding the Subject
- Attitudes towards Change
- Identification of the Problem
- Towards a Definition of the Problem
- More Examples
- Beliefs and the Built Environment
- Industrial Production
- Cause and Effect Relationship
- People's Participation in Design Process
- Development and Change

B. Methodological Approach

- Four Styles of Work

C. Organization of the Study

A. AIMS AND OBJECTIVES

• Propounding the Subject

The author began thinking about 'endogenous development' in 1983. He was a lecturer in the Department of Architecture at Shahid Beheshti University in city of Tehran while collaborating in a project run by Jihad-e Daneshgahi¹. There was a contract considering two universities' consultancy, i.e. The University of Shahid Beheshti and The University of Isfahan. The main objective of the project was to control the impacts of Mobarakeh Steel Complex, which is a new industrial pole, on the agricultural region of Mobarakeh Isfahan².

The two universities collaborated in the project and established a consultancy made of the two offices. One office was located in Tehran, in Shahid Beheshti University while the Department of Architecture was responsible for gathering information from subgroups in the other departments of the university and applying them in the project. This office should also work in the region and design two new towns for the factory. Another office was located in the University of Isfahan where the Department of Geography had responsibility to deal with ground theories and survey the region's problems to organize the comprehensive regional plan of Mobarakeh Steel Complex. The author was working with both parties in making models of their ideas³ for more than two years. Some of those models were his concern and have been used in teaching, management, consultancy, etc.

The main goal, for both offices, was to strengthen the region by identifying the indigenous techniques and investigating the people's relationships with their environment. They were also looking for some ideas to help protecting agricultural zones from industrial influences. These

¹ Jihad-e Daneshgahi is one of the new Islamic organizations which was established in universities after the Islamic Revolution of Iran to accelerate the process of their qualifications.

² Iran has 25 provinces one of which is Isfahan. Isfahan city is the centre of the province and is the most beautiful city in Iran and a famous cultural heritage with many historical buildings registered by UNESCO.

³ These models were published in a Persian language report in 1985 as the Technical Report of Mobarakeh Steel Complex Project sponsored by Iranian Government. Some of these models were further developed in 1988 by the author as the guidelines for cultural issues and the ways people and government can work together. The final and the most current version of the models were also published in 1988 as an Annual Report for the Ministry of Culture in Tehran.

schemes should control the immigration of labour force, the price of land, density of population and so on. It should also decentralize the powers in Mobarakeh Town and distribute services in the region to benefit other sectors, e.g. subsidies the regional plans and local projects to qualify people's lives by encouraging the use of indigenous resources and people's participation via a comprehensive plan⁴. The result was promising and led to some effective influences on development of the region. The main idea, which is about revitalising the productive forces in the region by pursuing their development goals from below, is one of the directive issues for the thesis, to chase the roots of an endogenous development model.

• **Attitudes towards Change**

How does this idea for supporting the indigenous communities and institutions fit into the long string of theories and definitions? Investigating the roots of development theories and strategies in philosophy, logic, and science, the author started to concentrate on the mechanism of change which can be implemented either through a comprehensive plan intentionally designed to emerge from within or can be imposed from without. Because of development and growth plans, dramatic changes are taking place throughout the world at an accelerating rate. Many believe that during this transitional process severe stresses and strains are felt by nations, regions, corporations, communities, and individuals. These pressures are aggravated in places such as Iran which is currently subject to a number of adverse factors affecting good development in built environment: population explosion, oil-dependent economy, finite resources, natural disasters, wars, etc.

There is abundant evidence suggesting that as some societies confront the harsh realities of current economic and ecological changes, they resort to or rely on their indigenous knowledge and their cultural resource base to help them deal with the stresses on their households and domestic economies. There are in Iranian culture beliefs inherited from a long history of change that enable the Country to cope with this type of need. There exist in these communities indigenous institutions, structures and processes that have been set up to satisfy

⁴ Most of the reports about these activities are in Persian, documented in the universities. They are also published in an annual report of the Mobarakeh Steel Complex in 1983 through which a research on Pudeh Village, which the author cooperated with, is remarkable and is briefed in Chapter Five.

basic societal needs. These are the resources of society that can be mobilized for alternative social development. They include the cultural resources of indigenous people, such as social consciousness and community identity, which generate common responsibility for an endogenous development⁵.

• Identification of the Problems

To highlight the confusions which exist within the literature about the ways of investigating the problems, it is helpful to know that the ways of going about identifying a problem are different. Actual and potential problems can be identified by concepts; symptoms (clinical analogy, for example in Ackoff's work), paradigms (scientific approach, like Kuhnian paradigms), etc. All interactions between objects, events, and their properties could be reduced by analysis to one fundamental relationship, cause-effect. But, there is still the need for teleological concepts (function, goals, purposes, choice, and free will) in explaining natural phenomena. Further exploration to identify the problems requires findings such as a statement from Ackoff (1974, p. 8) who writes: "The problems we select for solution and the way we formulate them depend more on our philosophy and world view than on our science and technology. How we go about solving them obviously depends on our science and technology, but our ability to use them effectively also depends on our philosophy and world view. These, in turn, depend on the concepts and ideas we use and how we use them to organize our perceptions of the world."

In addition to the ways one can identify the problems, it is necessary to say that purposeful systems not only need to deal with problem-systems, but they also need to maintain and improve **solution-systems** (plans), under changing conditions. Therefore, problem solving and planning have become conceptualized and continue to be directed at approachable but unattainable ideals. It is conceivable to say that absolute truth and perfect efficiency are never obtained but it is always possible to move closer to them. Furthermore, a person's ability to manage society's affairs depends more on her/his understanding of and attitudes towards the world that contains her/him than on her/his problem-solving methods. To reach an appropriate

⁵ See the definition about endogenous growth and development in Preface.

assessment of the problems in general and those of Iran in particular, it would be useful to mention certain principles about the nature and significance of an environmental or design problems which are discussed thoroughly in Chapter Two (2.A).

• Towards a Definition of the Problems

To analyse endogenous development, the topic of this thesis, and its appropriateness for solving some environmental and design problems, the author would like to refer to an example of a model which illustrates a natural cyclic process of production (Figure 1). This model is based on a villager's statement, collected during a regional planning survey which was carried on for the previously mentioned project between 1983-1985.

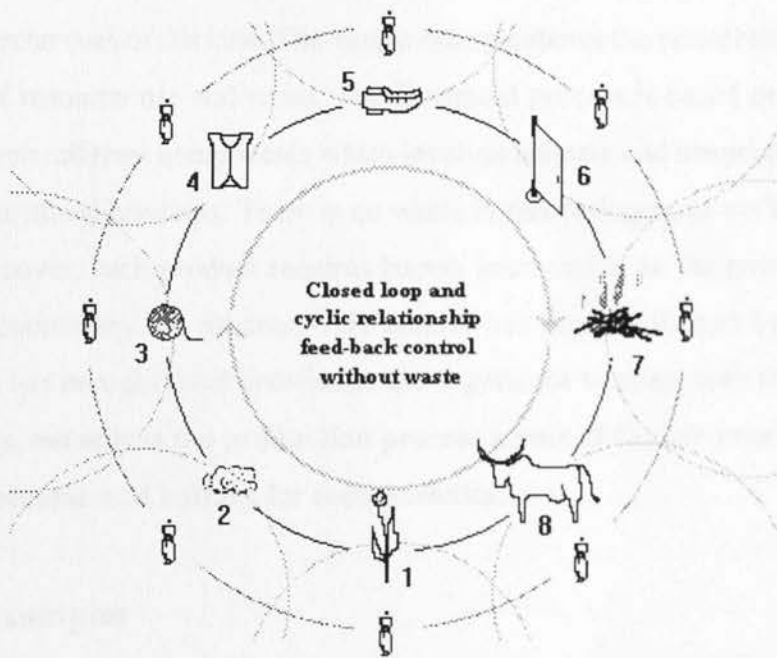


Figure 1 Cyclical and natural process with a lateral organization in an indigenous community
[see Chapter Four (4.B) and Islami, 1997a, 1997b, 1997c]
Source: the author

This genuine statement taught the author that there must be some scientific and cultural rules behind the organic and traditional activities in building environment and encouraged him to pursue a research into this approach. The villager describes the significance of the natural processes and says that:

- a) the clothes (4) are usually sewn with thread (3) which is made of cotton (2) and, in turn, cotton is picked off the plant (1);
- b) we [the villagers in Iran] make Givehs (5) [light cotton summer shoes] from the used clothes and the used Givehs are set under the wooden bolts of the doors (6) to secure and support them later; and
- c) when they are no longer useful, we burn them (7) to make smoke to cure the sinusitis of cows (8) whose horns and the other wastes are used to fertilize the cotton plants.

The model shows that indigenous people, in response to their environment, have been using several techniques for processing various natural commodities to satisfy their needs. There are many alternative techniques of this kind. This simple example shows the remarkable and subtle characteristics of resource use and reuse. The illustrated process is based on the cyclical relationship between different components which involves animate and inanimate processes, and natural and artificial products. There is no waste in this endogenous cyclic process of production. Moreover, each product requires human intervention as the producer who is responsible for controlling the process. This control has been facilitated by a feedback mechanism which has brought them knowledge and experience to adapt with the process of life. **Consequently, not only is the production process a part of the life process, but it is also cultural generator and battery for most societies.**

• More Examples

There are many instances that demonstrate the cyclic process of life and built environment, experienced by different sexes and classes, in many places in the world. For example, in the author's experience there were some which had significant influences in all stages of his life, particularly his childhood. They go back to the years between 1955-1965 before the notion of industrialization became dominant in Iran. Every child was the producer and the consumer of her/his own toys or dolls. Children used to make dolls from tailors' waste cloth and girls used to sew the clothes and skirts for them. They used to make wooden scooters from carpenters' waste. They also forged beautiful friendships using the empty oil cans as magic

shoes which were controlled by string or used them as portable light houses.

Copying the work of masons, the author used to produce sun-dried clay bricks, using match boxes as moulds to construct different spaces, similar to the function of Lego today. All the procedures for building small toy houses were exercised by children, including drawing, preparation, making of materials and their construction. They used to produce most of their own toys and dolls. This experience helped them to imitate real life to increase their skills and responsibilities and to accept their future roles in society.

Because each child knew about the process of producing her dolls, his toys or, s/he was very conscious of the needs to take care of them. This was the reality for all the people of different genders and ages who participated in the cyclic process of life. Moreover, they also learned to respect the materials, their relations, the knowledge of manipulating them, the wastes, the factor of maintenance, the role of experts, the principle of skill obtained by experience, the ways to participate in their work and play, etc. So, they tried to learn the cycling and recycling of life and its products in the way their culture recommended.

Furthermore, children had the same attitudes towards tending animals and plants, i.e. open systems. They used to train silkworms by gathering the leaves of mulberry trees and put them in the shoe boxes to feed them. They had experimental knowledge about and direct relationships with their surrounding environment. In Norouz Celebrations (the ancient Iranian new year celebration in the spring) there is still an opportunity to learn how to plant seeds and how to take care of them by rituals. So, most of the children are familiar with their environment and know, somehow, about the rules of its interconnected components.

• Beliefs and the Built Environment

The respect for resources such as bread and water, which is vital for survival, is still a fundamental property of Iranian culture. Those who are raised in this culture, take a piece of bread, which is left on the ground, kiss it and put it out for birds or in the spring to the fields (its original starting point). They have the same custom respecting water. They drink water while thinking about the value of having it, and about those who do not have it, but need it.

They do this by making a statement evoking their regards for the Holy Imam Hussein⁶ (pbuh), the third Shi'ite's Imam who was martyred in the desert while thirsty [See Chapter Five (5.B) for more detail about Shi'ism]. They respect water by building Saqakhaneh (a public drinking fountain), available to strangers and passengers, in maydaans (squares), gozars (footpaths), or attached to the exterior of houses with the purpose of contributing to public affairs. They also respect water as a symbol of heaven, cleanliness and purity and place it in the middle of the courtyard. They do not pour water in dirty places. They do not leave water in their cups or glasses so avoiding waste. They either drink all the water in the glass or pour it in a flowerpot or flowerbed. This consideration extends to the creation of small places for water in gravestones, in yards or on roofs of traditional buildings for birds.

In indigenous societies which are characterized by independent and self-reliant development from within, people are also very concerned about the validity of their resources. This is shown by their expression, by symbolic or instrumental principles, of their regard for their environment and culture. They learn through the indigenous structures of their societies about how to produce and cycle the products and about the contentment associated with appropriate use of its resources. The process involves people, animals and plants as well as artifacts. This compact and interrelated cooperation in the communal activities creates a sustainable development through which all people can find their roles in societies.

• Industrial Production

There is a notion that technical change has produced more wealth and affluence, more consumption, more education, more communication, and more travel in our century than was produced in all preceding centuries. It has also changed societies in fundamental ways and produced many crises (Ackoff, 1974). Industrial production is one of these technical changes which has special characteristics illustrated in Figure 2. This way of production is linear and the body of its processes is not within the society as it is with the endogenous productions. So, a minority of people process the inputs of the systems and the rest consume their

⁶ Imam Hussein (piece be upon him), the third Imam and the grandson of the Prophet Mohammed (piece be upon him), resisted Yazid's government and was martyred in AD 680. Shi'ism has been a resistant movement since then - a resistance ideology against any kind of injustice of states and other authorities, especially in Iran (Motawef, 1996).

outcomes. Therefore, this is short term gain for the few and long term loss for the many.

There are different stages in each line of this kind of production which are all separated from each other. The products resulting from the processes in each line do not have a direct relationship with the other products. They are produced by preset adjusted and feed-forward control systems [more explanation has been given in Chapter Four (4.A)]. So, there is no need for having productive integrated societies to control these procedures. Here, social activities are based on supply-demand relationship, which is in the surface structure of the system (Islami, 1996b, and Chapter Four). This kind of system, which is based on consumption, initially is not concerned about people's real needs nor the process of production, but with the progress of commodities. The main outcome of this is that work tends to be separated from home life and shifted to the isolated and unknown areas far from the households. So, there might be two cultures: culture of life without work and culture of work without life. Societies do not yet know how to respond rapidly and effectively to these crises, occurred by industrialisation, and may not learn how to do so in time. **Therefore, there is an urgent need to change our societies in ways that increase their ability to learn and adapt.** Alternatively, societies should change the paradigms of their development programmes which can be made possible by understanding the previous paradigms in this modern time.

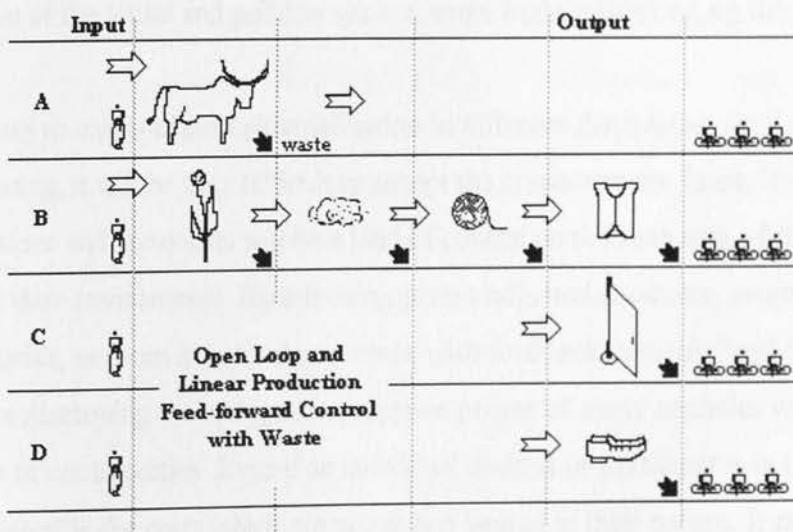


Figure 2 Linear and industrial process of production
(see Islami, 1997a, 1997b, 1997c)
Source: the author

Another phenomenon of modern time is the 'packaging syndrome'. **An urbanite does not grow her/his food, dispose her/his rubbish, sew her/his clothes or build her/his house. S/he is a passive recipient in the consumer society and is totally dependent on others for his survival** (Lim, 1990). This style of living is assumed to project an image of economic development and higher productivity. Here, again, there is a confrontation of preadjusted commodities which are the products of others. Therefore, the process cannot be natural (i.e., a closed loop cyclic process and feedback control). It is an open-loop linear process with a feed-forward control (industrial process) which may not help satisfying the user's needs and wants. For instance, the great majority have no say in the planning and design of their homes or places of work. Buildings in both the public and private sectors are designed and constructed for the users. Decisions are made by governments, corporations and developers, by financial institutions and by consultants.

The author argues that the individual user should be permitted or even encouraged to be responsible for the design, colour, materials of the external façade of her/his unit as well as for the arrangement of the internal partitioning. Planning regulations in many countries do not permit this kind of flexibility. Besides, the designer has to reexamine her/his creative process before such an intermediate and continuously changing design solution can be considered. The effective involvement of users can make important contributions to environmental identity. Irrespective of the social and political system, some basic rethinking on this issue is called for.

If one wants to extrapolate industrialisation in different disciplines, such as architecture and urban planning, it will be very difficult to accept the consequences. Here, it seems that the role of the agencies and specialists will be a kind of control on the authority of the users, especially in building their environment. By imposing preset adjusted products, people's creative power cannot flourish, as it can in natural processes with feedback control. Feed-forward controlled systems are destroying the endogenous creative power of many societies who become merely consumers of commodities. Even if an individual designs or participates in the design process, s/he will assemble the parts which are preset and limited in their nature. It must be understood that this thesis does not pursue a way to return to some kind of primitivity, rather it is looking forward to regain the purity and the originality of personal design. In this way, the author does

not intend to go back and create or invent things again. The attempt is to design according to the natural process (see Figure 1) to create a whole whose parts are flexible and natural, open to people as purposeful entities rather than to consumption. Of course, in a complex system, there has to be some sort of overall coordinated control, as well as the control of individual tasks.

Moreover, the ability to take the corrective action required to learn and adapt depends on the flexibility and changeability of the control and controlled systems of our societies. Most goal-seeking and purposeful systems, including private organizations and public institutions, seek stability (the concept of an internally generated 'structural stability' is comparable, and may be contrasted, with the 'homeostasis' of system theory) and, therefore, resist change. It is possible to design flexibility into mechanical (therefore passive) systems but it is much more difficult to design it into purposeful systems. The problems associated with so doing, and possible solutions to them, are the subject of a growing interdisciplinary effort frequently called 'organizational development' (Ackoff, 1974, 1984; and Hillier et al., 1972-73).

• Cause and Effect Relationship

The author argues that the comparison between the two traditions of production (natural cyclic process and industrial linear process) can be better understood if one discusses them in two specific domains. One is in a synchronous domain, having system approach which yields opportunities to compare feedback and feed-forward controls and their roles in creating supply-demand relationship between products. The second is concerned about the process of production which happens in a diachronous domain and is definable by studying the fundamental base of philosophy, i.e. cause and effect relationship (aetiology)⁷.

Describing some views about cause and effect relationship which seems to strengthen the philosophical backgrounds of industrial production, beside the definition cited by Hillier et al. (1972-73) (evolutionary/generative cause-effect), Singer (1959) notes that cause-effect was used in two different senses. First, it was used in the sense when a cause is necessary and

⁷ Logical principles, such as deduction, induction and abduction, are employed as the correspondence between these domains which will be discussed later in Chapter Four: the model (4.B).

sufficient condition for its effect. Second, it was also used when one thing was taken to be necessary but not sufficient for the other. For instance, an acorn is necessary but not sufficient for an oak; various soil and weather conditions are also necessary. Singer referred to this second type of cause-effect as 'producer-product' also called 'probabilistic' or non-deterministic cause-effect. Because a producer is not sufficient for its product, other producers (co-producers) are also necessary. Taken collectively these constitute the producer's environment. Singer went on to show why studies that use the producer-product relationship were compatible with, but richer than, studies that use only deterministic cause-effect. Furthermore, he showed that a theory of explanation based on producer-product permitted objective study of functional, goal-seeking, and purposeful behaviour. In fact, he and the others were trying to find out the proper scientific reasons for some of the Man's purposeful behaviour which are not possible to answer by deterministic philosophical cause-effect. Singer rejected linearity of causal relationship and analysed it systemically while Hillier was tracing its roots structurally by locating them in the diachronous and synchronous planes.

• **Production Process Paradigm**

It could be argued that process is seen as a different set of changes either in synchronous domain (generation of typologies) or in diachronous domain (evolution of theories) without being concerned about the causal relationships as correspondence between two domains. In Section 4.B of Chapter Four, **the study proposes that it is possible to open out a 'space' between the territories of cause and effect.** Into this opened out space can be fitted a sense of intention where goals (the ultimate, final cause) become mediated through this space into objects or typologies (the formal, externalized cause/effect). By these means, it is possible to see process orientated temporal elements similar to the process of becoming which refers to objectification of a subject, seen in the purposeful systems (Islami, 1996a, 1996b, 1996c, 1997a, 1997b, 1997c, 1998).

The process can be named 'production process' which refers to Man's creative power of changing subject into object, nonexistence into existence, multiplicity into unity, necessity into possibility and vice versa. Consequently, these changes lead to growth and development and help the transformation of the societies and their cultures. So, the stimulant of production

process is Man's intention which is strengthened by his knowledge and experience of his previous activities and the possibilities made by the resources and situations. The sort of knowledge embedded in this productivity is responsible for evolution of his thought and generation of the products. According to the thesis's proposal the process of production has four stages:

1. ultimate, final cause; (which stands for purposes and needs)
2. subjective cause; (which stands for agencies and disciplines)
3. objective cause/effect; (which stands for resources and conditions) and
4. formal, externalized cause/effect. (which stands for products)

Each goal/need one wants or has to satisfy requires some resources to be changed by an expert into a new product. For instance, in designing or building a house (formal, externalized cause/effect), an architect or a builder (subjective cause) designs or changes the resources (objective cause/effect) according to the user's needs or wants (ultimate, final cause). In this process, two points are important. First, for processing a product all four stages are needed to work together. Secondly, the results of the process cover a wide range of typologies, i.e. materialistic or non-materialistic products. The production process is possible over a period of time which can be categorized into **chronological time** (when the concern is about generation of typologies in products), **evolutionary time** (when the concern is about evolution of values and theories, i.e. final cause) and **deterministic time** which is irreversible and can be long run or short run according to the programmes.

This process is one of the two paradigms associated with the model of endogenous development and emphasizes on the 'final cause' as a start point of the process. Therefore, people have a significant role in the process within which they are creating symbolic principle and values to help professionals in implementing their ideas. There is also a need for people-centred or lateral organizations to help creating appropriate environment for growing from within. The other is concerned with relationships between the outcomes of the process named 'supply-demand' paradigm [see Chapter Four (4.B) for more clarification].

• People's Participation in Design Process

Creativity is not necessarily an individual act. It can manifest itself through intense interaction between small groups of like-minded individuals. Creativity is not data collection and compilation (Lim, 1990). **The creative process requires the ability to identify and synthesize available information and ideas to arrive at new solutions by creating new programmes or instructions.** The process for achieving a viable, exciting and humane built environment is very complex and calls for contributions from many individuals and small multi-disciplinary groups of problem-oriented task forces. Each task force member should be intelligent, creative and committed while being highly proficient in her/his own field of work. Beside professionals contributions (which is accomplished by deduction inference)⁸, there is a need for people's participation in design process (which is accomplished by abduction inference). This participatory approach can also shift the design process towards a wider domain that of production process (which is accomplished by induction inference), a manifestation of an open-ended living system.

As it was argued, indigenous knowledge and cultural attributes of indigenous societies such as community bonding, self-help, mutual aid, social responsibility, and the organizational capabilities of traditional polities are essential in qualification of the development plans. They also need to be reexamined for their contributions to an "endogenous" strategy of development.

Like language, one may not be able to find an inventor for indigenous urbanization and architecture. These have been built by people, by the creative power of society over a long period of time. **These spaces can be seen neither as a work of art nor an intellectual achievement, but as a living process, an open-ended dynamic activity in which each generation adds a new meaning and enriches it with its contradictions. The core of tradition is that there is a direct link between a society's design and its social health and identity.** Design is a manifestation of the social, political and economic situation. It is also clear that no city and no building has been or is developed by itself. There is a need for human

⁸ 'Deduction', 'abduction' and 'induction' reasoning are logical terminologies which is fully discussed in Logical Thinking and the Process (4.B.3.) in Chapter Four.

intention and creativity to generate different typologies of buildings and cities. This progress has been achieved by planning or design processes, either through participatory approaches or by the designer's sentience and knowledge (see Chapter Two, 2.B; and Islami, 1996c).

It seems timely, after considering the role of the designers, to look more closely at the general area of 'human motivation' or 'human needs', which is referred to in Chapter Four (4.B), i.e. the first stage of a production process relationship. By referring to human needs either in general or in particular, e.g. in a harsh situation, a likely outcome is that designers and planners should be concerned about the symbolic principles of the society which may be obtainable by people's participation besides the instrumental principles of the products which are referred to in multi-disciplinary approach in design professions (Islami, 1996c, 1997b).

This thesis intends to explore the diverse ways in which people perceive their environment and will provide an analytical survey of the problems that beset them. Later, it will attempt to bring these various elements into perspective and offer some directives for the establishment of humanity in the built environment and say that the mainspring for the designers and planners is evidently life - in all its breadth and depth - of the people for whom they are designing and the way they sustain that will depend on the depth of their knowledge and understanding of it.

• Development and Change

Development and change, especially in Developing Countries, are attracting more public attention and scholarly concern than at, perhaps, any other time in history. Traditional structures have been seriously questioned and sweeping changes proposed; simultaneously, efforts are being made to penetrate the fundamental processes by which development plans operate. This effort calls for new knowledge from a number of substantive areas. Sociologists, political scientists, economists, geographers, planners, historians, anthropologists, and others have turned to development questions. Interdisciplinary projects involving scholars and activists are groping with fundamental issues. Up until now, many of these issues are still unresolved, and **this thesis will, therefore, attempt to add a timely contribution to the continuing debate and is an attempt to open up the discourse about endogenous**

development which can be addressed to scholars and students as well as to planners, administrators, and others concerned with a more analytical understanding of the mechanism of the development processes.

Development of a person or a society, is not a condition or state defined by what or how much that person or society has. **Development has less to do with how much a person or society has than with what it can do with whatever it has.** Because development involves an increase of ability and desire, and because one person or society cannot learn or be motivated for another, one person or society cannot develop another. One can only encourage and facilitate the development of another. Ackoff et al. (1984) believe that there is only one type of development: 'self-development'. Therefore, **governments cannot develop the governed, but they can encourage and facilitate the development of the governed.** If there is a problem whose dissolution⁹ is an opportunity for development rather than growth, it is not necessary to look for what governments can do to solve the problem, but it is for what they can do to encourage and facilitate solution of the problem by the governed.

Growth is a change in size or number. It can be negative or positive. Organisms can increase or decrease in size, and populations can increase or decrease in number. Economic growth refers either to an increase in the size of an economy or an increase in measure of its performance. It usually occurs without choice in most biological systems. Many people see a society's compulsion to grow as being natural, even laudable because that physical or economic growth is necessary if not sufficient for development. If limits to growth limited development, one could understand a preoccupation with growth. **The author does not see growth as necessarily limited. It is a means not an end and is, therefore, an option that should be evaluated concerning precisely formulated social objectives.** Those who believe in endogenous development take development to be the end that purposeful individuals and groups should seek. In this regard, development is not a biological but a psychological, cultural and social concept. It is with respect to people's contribution to development that proposals for revitalizing societies and their economies should be evaluated.

⁹ Dissolution is a way in which Interactivists treat problems. (See the definition about this term in Section 1.A: Problem Identification in Chapter One.)

B. RESEARCH METHODOLOGY

Designers, especially architects and urban designers, have a certain way of demonstrating their work. Their images presented for approval have evolved from many other studies, explored pictorially and considered synchronically, i.e. sketches and design models. It has a system made of components with a network of relationships which is either two or three dimensional [see Chapter Four, Modelling (4.A)]. Therefore, it is not linear and has its own characteristics (Figure 3). In this strategy researcher or designer is concerned about a target (research question) ambiguously. S/he, by focusing on the main issues, starts to gather more information and evidences. The more relevant the information, the closer it is to the centre. The objectives ensure that the research is in the right direction, and the research questions will keep and maintain the trend of the research towards the centre. Through an inward journey towards the centre, an investigator may pass different stages or the components (components a, b, c, ...) of the process over time. This shows that time plays an important role in the process.

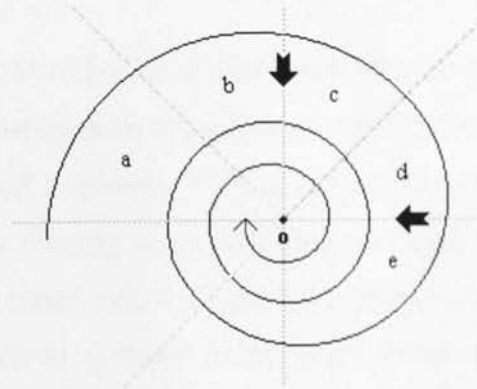


Figure 3 Spiral as a pattern for the research strategy
Source: the author

But, when the researcher wants to express ideas with the other experts, for example, by a written thesis, s/he should have another strategy for editing a particular kind of systems drama. This seems to be different from the research strategy. The common model, for making that, is linear¹⁰ with a beginning and an end. So, a chain of simultaneous hierarchical relation between words, sentences, paragraphs ... chapters and parts of a text, or different components

¹⁰ For more details refer to the section named 'Modelling' in Chapter Four (4.A).

of a system, is necessary to understand its whole meaning or to select the needed information from it. The differences between these two approaches are illustrated in Figure 4.

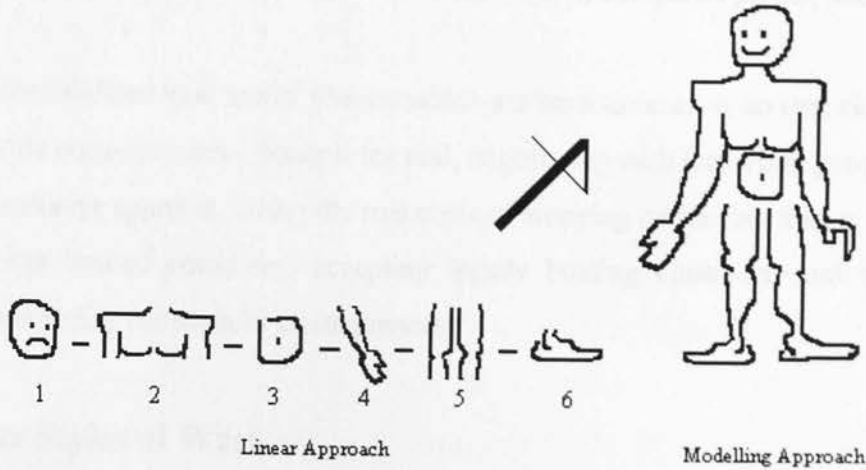


Figure 4 The linear relationship between the components of a textual writing and the transaction between them in a pictorial model
Source: the author

Describing the research process of the thesis, the author would like to refer to Carter et al. (1984) who suggest a model which distinguishes process on two dimensions: the 'here'-'there' dichotomy, and the 'fluid'-'consolidated' dichotomy. They state that practical change involves a particular kind of systems drama: Finding some practical route from 'here' (the present situation and all the messy practical constraints, fears and opportunities that it involves) and making the mental and physical journey to 'there' (some future states that one conceives, perhaps in clear detail or perhaps as little more than 'getting away from here'). Because few dramas come to a happy conclusion in the first act and first time around, it is unlikely that there is a need for finding exactly the right compromise that meets real needs. That can be achieved effectively and is actively supported by the people involved. Yet, if the findings are wrong in a very public way, the response may prevent any second chance. So, it is better to try not to jump in at the deep end, and keep most of the trial-and-error offstage, making it useful to distinguish between fluid and consolidated phases. Here, the same authors classify the first dichotomy of their model in page 26 of their book: 'Systems, Management and Change' and describe it as:

1. "the fluid 'bright ideas' phases in which you can change your mind without serious consequences - you can toy with possibilities, find out how things tick, explore the potentialities of a situation, dream up alternative proposals, sketch ideas, prepare pictures and descriptions, experiment with models, compare options; and
2. the consolidated 'real world' phases, which are hard to reserve, so that changes have serious consequences - doing it for real, negotiating with important people, getting authoritative approval, facing the real costs of stopping or starting things, competing for the limited resources, accepting legally binding contracts, and taking real responsibility for harmful consequences."

• **Four Styles of Work**

According to the model cited above the journey in research is not from 'here' to 'there', but also from 'fluid' to 'consolidated' (Figure 5). But, the main question is when to work and in which style? Much of the skill in effective action lies in knowing how best to mix these four styles of work, and too colloquial has been written on how to do it. Considering procedure of the research with reversible time which is different from process of the operational research with irreversible time, Carter et al. (1984) claim that one can think of the four styles as rather like rooms in a four-roomed house. Living does not have a fixed sequence. One likes to move easily from one room to another when s/he needs to. All the rooms work together as a 'system for living in'. It is quite normal to spend a lot of time in one, or pop briefly into another. But, if one spends all her/his time frantically running from one room to another, or alternatively locks herself/himself all the time in one room only, something has probably gone wrong. The same authors also claim that just as each room in a house imposes its personal role, atmosphere, functions, and customs, each style of work tends to have:

- a) its own specialists;
- b) its own approach and driving force; and
- c) its own typical problems and techniques.

The logical sequence from fluid to consolidated and from here to there is giving us:

Analysis → Inventive Search → Groundwork → Implementation

But, it is not as simple as that, and implementation is rarely the 'last word'. All sorts of sequences can occur for instance:

Analysis → Groundwork → Analysis → Search → Groundwork → Analysis
→ Implementation → Analysis → ...

Whether these sequences are relevant to all situations is not certain. Nevertheless, a degree of reality exists in all these sequences in case of research procedure. So, it is preferable to place the three parts of the thesis in the first sequence as: the first part for analysis, the second part for inventive search and the third part for groundwork. The application of the thesis, which is discussed in Conclusion (Chapter Seven), will go for remaining part of the model (Figure 5). Therefore, the thesis has contributed with both parts: with Part One and Part Two.

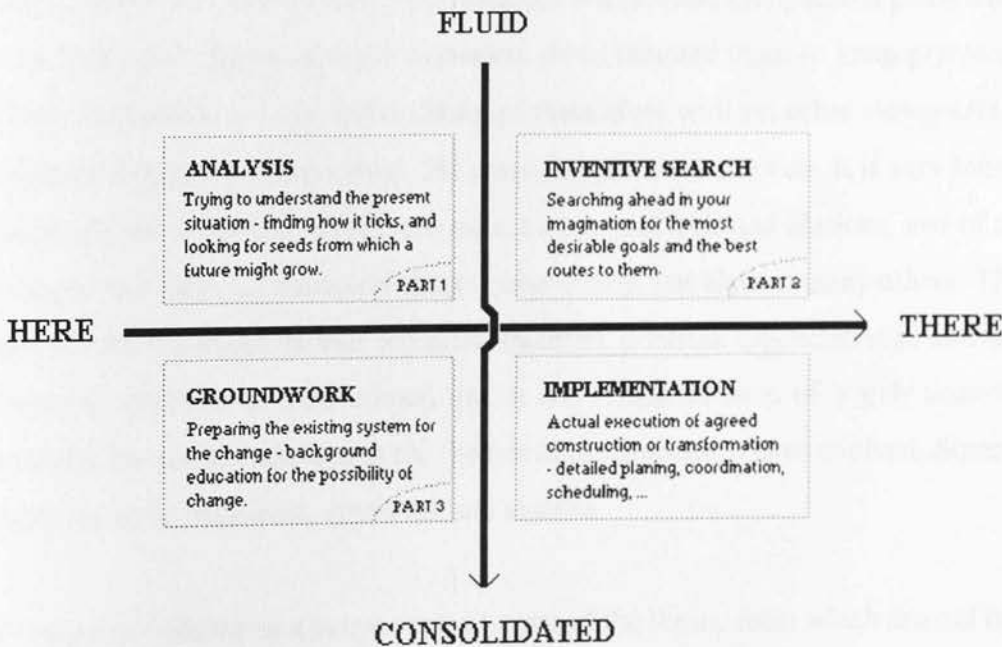


Figure 5 The mental and physical journey from here (practical change) to there (some future states) and from fluid (bright idea) to consolidated (real world)
 [Adapted to Carter et al. (1984), see also Geddes's fourfold diagram named 'thinking machine' in Section 4.A: Modelling in Chapter Four.]

Analysis is needed for unfamiliar situations. One is no longer sure what to do. S/he could just 'jump in at the deep end', learning by random trial and error and intuitive hunches - the heuristic approach. But, a practically oriented description or map of the situation can often be very helpful. Description makes a situation thinkable, and that makes it easier to talk about, to share, and explanation makes it easy to act within. Some descriptions and explanations are more useful than others. If one can get the right description and explanation, the action needed will often be obvious. A problem is 'solved' when the people involved have found an actionable way of describing or explaining it, for example, in this thesis by using simulative approach and making model of the situation. **Before the author starts describing the model of the thesis in Part Two, there are some useful preliminary activities to bear in mind by having a glimpse on the existing discourse in Part One and bringing evidences from the case studies in Part Three.** It is wasteful to home in too soon on what may turn out, much later, to have been the wrong area.

The author does not quite know how the discussion started, but it did. People kept on tossing in images, viewpoints, information. An ambiguous but rich and complicated picture began to form in their mind. Again, strongly expressed views tempted them to jump prematurely to 'shortcut' conclusions, and they had to challenge themselves with yet other viewpoints to stop their system of ideas becoming closed. The emerging picture is not tidy. It is very loosely and inconsistently structured and full of loose ends, a mixture of facts and illusions, and of symbols and images that each say particular things quite clearly, but hints at many others. There are all sorts of different angles: human, technical, financial, political, organisational, aesthetic and atmospheric, procedural, motivational, etc. It is a resources-heap of largely unsorted raw material that has seemed relevant as the themes of the discussion have evolved. Some bits of the heap are quite organised; others are still chaotic.

Some stages in building up a better vantage point of the thesis, from which several issues as a brief introduction to the definition of the research methodology emerges, is illustrated in Figure 6 which indicates that the process of research could be similar to the process of design and always passes in a cyclic order, the modes of 'analysis', 'synthesis' and 'evaluation' in order to 'identify', 'define' and 'specify' some aspects of the research questions.

Inductive processes result in models and deductive processes result in plan and descriptions. Description can be anything which represents attempts to make various experiences communicable (Bax, 1989). Analysts tend to use the word 'model' rather than 'description' or 'explanation' when they want to indicate that the description or explanation has been prepared in a careful 'quality controlled' way rather than by informal verbal ones, though the distinction and explanation are far from absolute. Whether they are systemic or not, description, explanation and modelling always involve simplification, because we have to simplify in order to communicate [see Chapter Four (4.A, and 4.B)].

All these explanations may help to achieve an appropriate model for structuring the thesis to illustrate both its content and its form. This model can be radial and static which has different sectors as is suggested in Figure 6. It has three parts, as three phases, which respond to 'identification', 'definition', and 'specification' of the research.

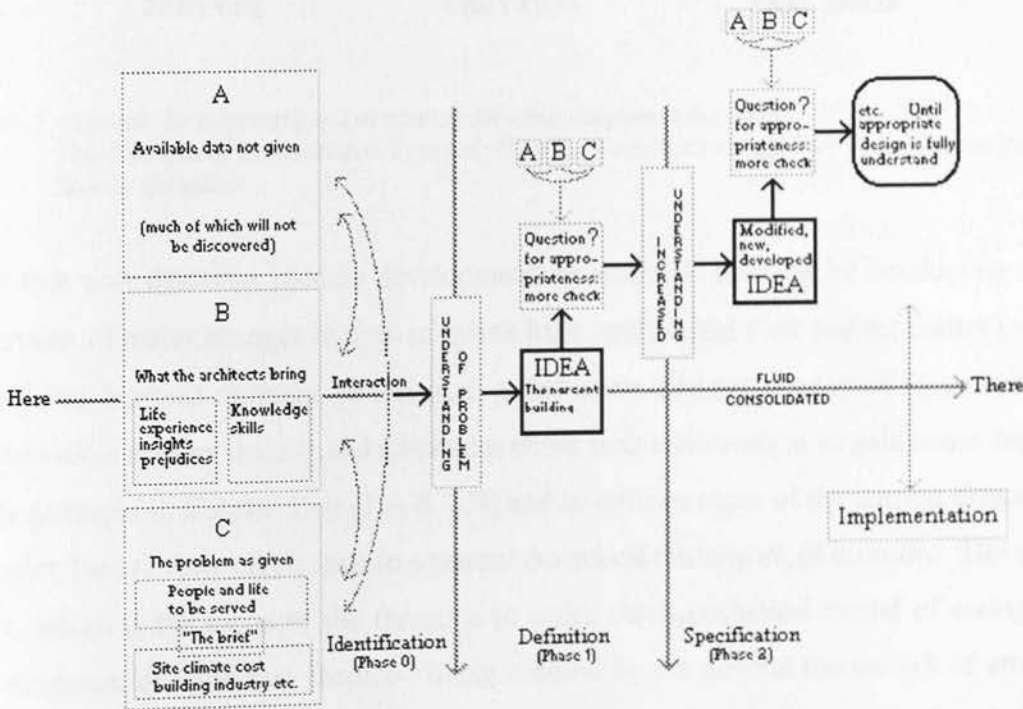


Figure 6 The design process in different phases

This can be used as the research process with some clarifications.

(derived from Maguire, 1980; Carter et al., 1984; Bax, 1989; and Islami, 1997b)

Source: the author

C. ORGANIZATION OF THE STUDY

The themes described above demonstrate 'why' the line of work was undertaken. Now, there is a need for sketching out 'what' this research consists of and 'how' it is organized. A flow of research, encountering different strategies, is manipulated passing through the three parts in the thesis which is illustrated in Figure 7.

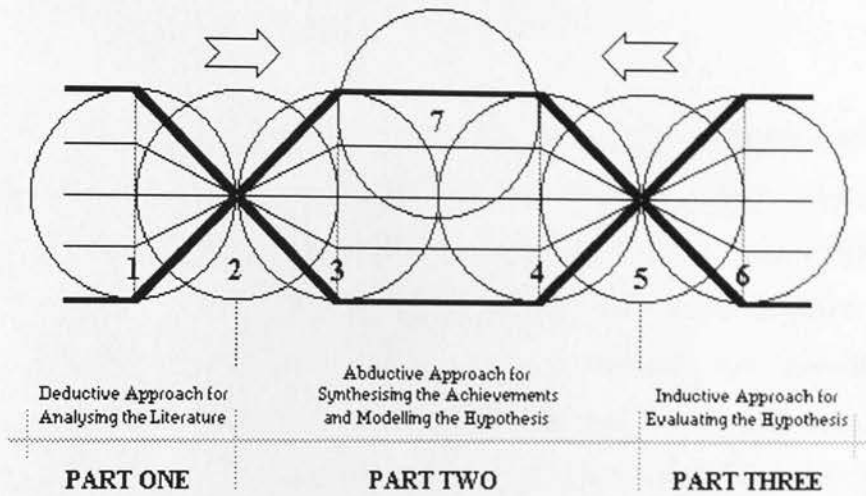


Figure 7 A model for organizing and structuring the seven chapters of the thesis
The direction of the research is from both sides, i.e. from Part One and Part Three towards Part Two.
Source: the author

The first part describes specific developments in scientific thinking by conducting a brief overview of major changes in how scientists have approached their subject matter over the years and has two chapters. In this part, a deduction strategy is adopted to describe and explain some existent theories and ideologies about built environment to gain some details of their concepts in Chapter One (1.A & 1.B) and to criticise some of the current discourse in Chapter Two (2.A & 2.B) leading to a general theoretical framework of attitudes. The second part, which is the focus of the thesis, is to make the hypothetical model of endogenous development and has two chapters. Being assisted by the general framework of attitudes, Chapter Three (3.A & 3.B) manifests the attempt for analysing the model of 'endogenous development' and tracing its roots from the debates of system view and structuralism within epistemology and teleology. Chapter Four (4.A & 4.B) states the casual relationship between the elements and components of the model which is supported by the examples and samples from Part Three. The third part shows verification of case studies testing the model which

involves two chapters. In order to test the theory of endogenous development, the application of the model is examined in its respond to the rapid changes after disasters, development plans, and government programmes in Chapter Five. Following the empirical cases, people's opinion about development and change and their role in decision making process has been explored by an open-ended questionnaire in Chapter Six. Chapter Seven is to make relationship between the results of the three parts to apply the theory and recommend further research. This is adopted to end the research procedure.

Work of this kind is heavily reliant on the science of organization, comparing epistemological and teleological approaches in defining the differences between systemic view and structuralism, for its theoretical bases. However, when the emphasis is on development, as it is here, theoretical work from philosophy, etiology and social sciences (particularly psychology, social psychology, sociology) is more relevant. Yet, because the social construction of human activity must eventually be juxtaposed with another set of phenomena concerned with the physical organization, an aggregative level of study and analysis, somewhat outside the mainline empirical traditions of these themes, is required. Moreover, such analysis lends itself well to the possibilities of using a systems approach in the analysis of the interface between activities and the physical organization of space, an emphasis which is also somewhat outside the traditional empirical orientations of this thesis.

This is a general scope of an approach to the study of endogenous development. Although it aims to serve as a beginning in the development of a theoretical framework for understanding and interpreting this view of change and growth useful for planning and policy formulation, it serves an immediate purpose of providing guidelines for the series of empirical studies taken up in ensuing chapters. The details of what is proposed here will require considerable refinement and validation.

PART ONE

A CONCEPTUAL FRAMEWORK OF THE RESEARCH

INTRODUCTION TO PART ONE

This part consists of two chapters. One objective is to outline the theories of the discourse, to review and critically examine key principles and thoughts which are to be found in the literature. Another purpose is to give an overview of the progress of the research. It was decided by the author that unless this was done it would be difficult to understand the nature and significance of the key postulates of the thesis, for building up a model of endogenous development theory. Therefore, the approach of the thesis is deductive at this point, and has a framework based on a hierarchy of stages leading towards ever more focused discussion. The focus in Part One, across the two chapters, starts with philosophy and world views, leading eventually to the disciplines of the built environment. From a broad to a specific field.

In Chapter One for example, the discourse is relatively general, focusing on problem identification. Out of this, the necessity of a world view became apparent. The author emphasises that his method of research in the thesis is not a systematic one; rather he is searching for a paradigm enabling him to define change and stability in transformation. This is reflected both in the research and in development itself and allows for the identification of indicators in development programmes. He opens up the discourse in such a way as to discover and identify the key elements that lie within it. The aim of Part One is to find the tools, the components of the discourse for helping to build up the model, which is the final aim of the research. Because of a deductive attitude towards the discourse, the author is trying to get right inside the principle, at the end.

The discourse discusses development problems and suggests various solutions for them. One of these solutions is people's participation which is frequently mentioned. Chapter Two, therefore identifies people's participation as a vital element of development. In order to further examine people's participation, a critical analysis is taken of the subject, where the author purposefully selects the role of this notion in production processes, i.e. to find the hidden paradigms held in the descriptive notion of people's participation within the design process of building the environment. It is in the discourse that people's participation has been used not

as an end towards creativity but as a tool. Within people participation, creativity is the most difficult. The author decided to examine this notion in the design process, both within the decision making process and within creativity.

The thesis's approach is to concentrate not only on descriptive, but also on explanatory methods of research in order to lead towards the simulation of the outcomes of the discourse. This will help to have appropriate criteria to evaluate them. Some criteria for evaluation in this part come directly from the discourse and others come from the author's own preconception and history. The point here is that the model which is to be built in Part Two is developed from this process. The main evaluation of the proposals of discourse and the model itself is left to the reader, i.e. after reading Part Two and being informed about the model of endogenous development theory. The structure of the research is designed in such a way that while the parts and chapters of the thesis look standing independently from each other, they nevertheless serve collectively a general structure whose aim is both to evoke an attitude and build a model of endogenous development theory.

While the intention of the author attempts to be neutral in introducing and analysing the discourse, gradually certain key theories have created an impact on him which was then adopted throughout the thesis. The aim in Part One is not therefore to clarify the discourse, or to bring a new idea to judge it, but to find the bones which make up the skeleton as metaphors or paradigms which are used by experts in the specific areas under examination. These key elements, which are already part of the discourse, are brought together to form the structure of the new model. In this regard, Chapter One is relatively impartial and Chapter Two begins to develop a paradigm. This marks a shift from a deductive to an inductive approach. Chapter One, which searches for a more accurate and reliable meaning of development, goes into details to expand the knowledge about development. Chapter Two limits the area of examination and begins to build a model based on a feedback mechanism by which the objectives and results of the development processes are closely interrelated. Therefore, the simulation, the collection of key elements which have been gathered, examined and laid out in Part One, will be built into a more holistic model in Part Two.

Finally, to reiterate, Chapter One is an opening up of the discourse in order to discover its constituent elements and to examine them in detail, gradually refining and focusing on a few

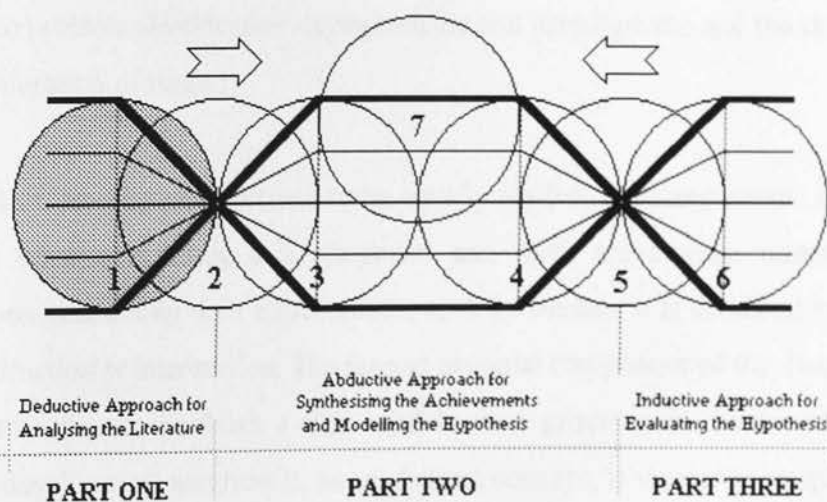
key elements. Chapter Two then begins to build towards a model, it brings in a certain amount of critical analysis, both from personal background and from the discourse itself. Attention moves towards the redefining and recategorising of the constituent part using key theories of the discourse as well as the author's views, which he derived from his own practical and academic experience in this field. This has helped him in the evaluation of the significance and relevance of many of these concepts.

INTRODUCTION TO CHAPTER ONE

1

CHAPTER ONE

COMPONENTS OF DISCOURSE



INTRODUCTION TO CHAPTER ONE

This chapter is divided into two sections, both of which are essential components of the discourse of the thesis. The first section, Problem Identification, is an overview of philosophical issues that aids the author in determining the framework for the study of problems. It is a broad unfolding of universal concepts and it lays the foundation for the model that is the core of the thesis. The second section, Development, is a distillation of definitions of development as expressed in literature. These texts established a general theoretical structure as to what constitutes a development definition. In combination, these two components represent some of the theoretical reference behind the thesis.

Everybody is aware through experience and anecdote of 'problems' yet the term is a complex one. Problems cannot be assumed to be self-evident, as their recognition depends on values and symbols held within the human consciousness and compared to particular expectations. The symptoms that people react to are caused by more fundamental and less visible phenomena. Remedying the symptoms does little to stem dissatisfaction. Therefore, before concentrating on a specific type of problem in a specified location, the author needed to outline the general framework of what constitutes a problem in people's minds and how these can be interpreted from apparently straightforward opinions. The literature indicated two approaches to problem identification - symptomatic and paradigmatic and the thesis will start with a consideration of these.

The concept of 'development' proved to be equally elusive. Different people hold different ideas as to what constitutes a development and there are a great number of lesser considerations concerning their expectations, such as whether it is validated by radicalism, scale, reconstruction or intervention. The second essential component of the discourse of this thesis was therefore to establish a clear model which provides the reader with a reliable definition of development and how it, as an abstract concept, is viewed in people's minds. It serves to construct a necessary world view that helps define development in terms of change and stability in transformation.

1.A

PROBLEM IDENTIFICATION

Introduction to Problem Identification

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1.A.2. **Identification of the Problems**

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1.A.8.6. Technology and The Development Problems

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1.A.8.8. Decreasing Morbidity and Increasing Life Expectancy

1.A.8.9. The Economic Problems and Development

1.A.9. **The Problem**

Conclusion of Problem Identification

Introduction to Problem Identification

While in many countries the development experience appears to have been satisfactory in respect of the growth of a modern industrial capacity, in other respects it has engendered social, environmental, and economic problems which have become increasingly serious. Some notable features of these experiences are classified by Fadaka (1982):

- a) a continued state of unhealthy dependency on external economic relations for sustaining domestic patterns of growth and growing external debts and deficits in the balance of payments;
- b) a persistence of mass unemployment and underemployment and poverty;
- c) low productivity of labour and other factors of production; (the internal dynamics of growth has not led to self-sustaining and self-reliant economic development in several cases. Moreover, sizable sections of the population, including women and rural populations, have been left out of the mainstream of development.)
- d) excessive and environmentally harmful growth of big cities, urban congestion and marked deterioration of environmental health in urban settlements;
- e) technologically created unemployment through the adoption of highly capital-intensive; (that is labour-saving, technologies in the process of industrialization, and the use of capital-intensive technologies on large farms.)
- f) growth of monoculture and commercial farming for export at the expense of production of food for domestic consumption;
- g) wide and increasing disparities in the distribution of income and wealth and unhealthy imbalances in consumption patterns and life-styles of the few privileged on the one hand and the socio-economically disadvantaged on the other; and
- h) crisis in the formal education system.

Accordingly, this study is concerned with the concepts of planning and design and how they confront human needs during growth and development programmes. The purpose in this part is to introduce current problems facing many societies which result from misunderstanding the knowledge which is required to accommodate people's natural responses. In this respect, there is a need for finding their causative factors and the ways of solving them. To reach an

appropriate assessment of these problems it would be, perhaps, useful to mention certain principles about the nature and significance of an environmental or design problem.

One fundamental question is 'how to identify a problem'. That is to investigate what is below the surface of contemporary problems. Where in the historical and evolutionary process and hierarchies of the Man-environment relationship this problem locates itself? The aim is to get an insight into the issues and complexities associated with identifying the problems by recognising them, describing their structural properties and explaining their functional properties, and finding their causative factors. Then, the content of different explanations of the process of solving problems will be explored.

Moreover, the problems an individual selects for solution and the way s/he formulates them depend more on her/his philosophy and world view than on her/his science and technology. How s/he goes about solving them depends on her/his science and technology, but her/his ability to use them effectively also depends on her/his philosophy and world view. These, in turn, depend on the concepts and ideas s/he uses and how s/he uses them to organize his perceptions of the world (Ackoff, 1974). Fundamental changes in these organizing concepts and ideas and the way they are used move societies from one age to another. A person's success in managing her/his society's affairs depends more on her/his view of the world and the philosophy s/he lives by, than her/his science and technology. It seems that, the future depends greatly both on and how well one uses appropriate technology to solve them.

1.A.1. Definition of the Problems

The immediate character of a problem lies in different factors. Alexander (1970) pinpoints them and states that they are structured in a specific hierarchical organization and set up by temporally derived causative relationships. Furthermore, the actual implication of such a structure of factors lies in the very principles which control the processes and timing of the various events, and behavioural patterns which have characterised human environment and cultural adaptation. He suggests that without a profound and cumulative knowledge of this structure, the designer will inevitably fail to cope with his design problem and will fail to produce the appropriate proposals. Perhaps we should remember his claim that: "not only is

this knowledge essential for the production of more fit designs, but it might then, when possessed, 'consciously' inspire contemporary practices by making the solutions correspond properly in their structure to their real situations."

1.A.2. Identification of the Problems

It is necessary to recognise the problem and investigate its relevance to its indigenous context. Otherwise, the perceived problem might occasionally embody a false assumption in the first place. Describing the problems, about gathering information, by improving the methods of managing information will be more appropriate. Sophisticated expression of linguistic difficulty in describing problems will be more acceptable and true by ascribing the situations (Ujam, 1987). It could be also argued that embarking on a solution without attributing the problem to its proper situation might lead to further problems.

Getting insight into the complexities associated with the identification of the problems, Ackoff (1974, p. 231) suggests: "Actual and potential problems can be identified once symptoms and omens (presymptoms) have been identified. A symptom is a deviation of a system's behaviour from what is considered to be normal behaviour ... can be used as symptoms. Symptoms may indicate either threats or opportunities: high costs, for example, may indicate a threat, but abnormally low costs may signal an opportunity."

Well-developed statistical producers are available for defining 'normal behaviour' and for detecting significant deviations from it. These involve analysis of past and the current performance of the system which is being controlled, comparison with other similar systems and their environments (Ibid.). Highlighting the continuation of the investigations and treatments, the same source indicates that the selection of performance measures and indices to be used in symptom surveillance cannot presently be automated. It requires enlightened human judgment. It is particularly difficult to provide performance indicators that measure human performance, measure quantity such as wealth but not quality such as happiness.

The same source in page 232 modifies more explanations and claims: "Once a diagnosis has been made, one can determine whether or not action is required. Diagnosis may reveal a self-

correcting situation or one about which nothing can be done. If, however, a problem is revealed, then it can be fed into the decision-making subsystem." Beside this, Ackoff points to a citation by Schon (1971) who has an optimistic view of timing the clinical analogy and claims: "The times required for diagnosis, for design of demonstration, or for extension to the next instance, are long enough ... to include changes which invalidate conclusions once they are reached." Furthermore, there is a concept of scientific 'paradigms' which stems from Kuhn (1970). A paradigm, he says, consists of a set of implicit rules for identifying a valid scientific problem, and for recognizing what would constitute a solution to it. Rosenhead (1990) has identified three conflicting paradigms: official, reformist, and revolutionary.

Therefore, the ways which are struggling for more authority to identify a problem are different. Actual and potential problems can be identified by the concepts, symptoms (clinical analogy), paradigms (scientific approach), etc. This thesis intends to present some significant points of both strategies and emphasises on this matter that **symptomatic view gives us a better understanding of the fields through which the application of the concepts in built environment is possible and paradigmatic approach furnishes us with the tools to dominate the hypothesis with the appropriate rules to 'dissolve' the problems.**

Although every state or nation has its own unique history, it would be useful to identify the roots of the problems in the so called Third World Countries, where usually some authorities or administrators imitate Western patterns of development, or search for the entities to identify some international problems which usually follow the history of Western Countries. What emerges from this investigation is the necessity of having clear idea about the origin of the emergence point of the problems for being capable of having control on their influences. In this respect, it is worthwhile to refer to Appendix One: Section (a) for knowing more about Ackoff's (1974) classification of the problems which are frequently used in the following text and are divided in three eras: Middle Age; Machine Age; and Systems Age.

The point which can be extracted from this classification is that **problems are conceptual constructs from complex situations that are systems of problems: messes.** Solutions are also abstractions: no problem is ever finally put to rest. Therefore, solutions require control:

continuous maintenance and improvement. Controlling the solutions, which signifies the necessity of continuous maintenance and improvement, celebrates a new era, following the Systems Age. The era which either emphasis on change, evolution and transformation by using the available information from structuralism theory, or enhances the system view's achievements when talking about explosion of information and fast accessibility to the public affairs, which is the result of the progression in electronics. However, to deal effectively with a problematic situation one can determine both what it has in common with previously experienced situations and how it differs from them. At the end of this discussion, it is worthwhile to pinpoint the fact that **humanity brings differentiations and science and technology seeks for similarity or sameness** and conclude that **awareness of similarities enables one to use what is already known; awareness of differences enables her/him to determine what must still be learned.**

1.A.3. Problem Solving and Management

Successful problem solving requires finding the right solution to the right problem. People fail more often because they solve the wrong problem than because they get the wrong solution to the right problem. **The thesis is more concerned with the problems people have failed to face than with those they have faced unsuccessfully.** Moreover, by clarifying the process of problem solving and decision making in management, it would be worthwhile to remember Ackoff's (1974) statement that management involves decision making and decision making involves problem solving. Problem solving will be the essential function of management, if there is any doubt for decision maker to make the choice.

The priority of making the choice in management is perhaps a key point. Because, in the native societies people are more concerned about the life itself than its problems; they do not perceive problem solving as a forerunner in the process of their lives. They rely mostly on their aspirations and plans, as a tool for expanding opportunities to make their choices, to qualify their lives in the future. Therefore, they conceive problem solving as a means for their purposes not an end for itself. In this respect, managers and planners should avoid emphasising only on the problems in their programmes, otherwise, they may enforce people to be passive instead of being active. It means that, in those communities, either by having a

doubt of making the choice or by choosing the false problems for solution, people may live in an abstract and secondary phase of their life processes. So, they may have to endure spending more time and energy by solving the wrong problems.

There are different approaches to solve the problems in different fields. For instance, in psychology, Piaget's studies of young children led him to believe that initially they pose new successful solutions to any of their problems. Initially they thrash about, hitting and squeezing objects. Occasionally they meet with success, and remember the success as a mental "schema" which can be used again. When first attempting to use a fork, the child will try out the thumb and finger routine. He says that it is what the child knows about and is an obvious starting point. If the existing schema copes with the problem, the problem has been "assimilated" to the schema. If it fails, then the child experiments with other existing schemata until a new and successful action arises out of the old. Now a new evolving schema has been developed to "accommodate" the problems. In this way, each of us as adults carries a repertoire of schemata which are possible solutions to the problems.

Beside the brief definitions cited above, here is time to notify again that management involves decision making and decision making involves problem solving which is concerned about the possible solutions to the problems by relying on some repertoire schemata. Now, it seems advisable to look for the relationships between management as controlling system and the other systems. As it has been noticed, management whose function is to control another system must either be part of that system or be part of the larger system. Therefore, a control system can always be viewed as a subsystem. It may also contain its own subsystems.

Managers and decision makers, almost, always do the familiar and the simplest thing first. Therefore, it is suggested to automate management and management-support systems (such as universities, government agencies, etc.) by relieving them of dull jobs to enable them to take on more complex and challenging tasks that are often neglected for lack of time. Furthermore, automation is said will help management systems to process properly. Those management and management-support systems that can be automated are those which are simplest, most routine, and most repeated. For identifying more complex and challenging

problem and making decision about them, there is a need for flexible and automated management which is supported by a system. In general, the only organizations that can survive management are those protected from their environments by subsidies that assure their survival independently of what they accomplish. In communal and indigenous societies, these environments are created by the whole system whose parts are thoroughly integrated.

1.A.4. Problem Solving and Planning

Highlighting the confusion which exists within the literature about the meaning of problem solving and planning, it is conceivable to mention that the attempt to deal holistically with a system of problems is what planning, in contrast to the problem solving, should be all about. Planning is used here as an abstract concept which is not a reference to the particular meaning of Town Planning or Environmental Planning emphasising a professional process. Furthermore, the thesis's concern is that knowledge may be enough for effective problem solving but it is not enough for effective planning. Planning, Ackoff (1974) says, requires wisdom and wisdom is as much a product of the humanities as it is of science (see Chapter Four, where the differences between knowledge and science are described, and Figure 1.A.1).

There are many managers and administrators who do not believe in planning. Attitudes towards this approach vary a great deal and can be grouped according to Ackoff's (1974) classification into four general types: 'inactive'; 'reactive'; 'preactive'; and 'interactive'. He describes these attitudes and claims that they are mixed in varying properties in each individual and organization and the mixture may change from time to time or from situation to situation. Furthermore, many attitudes towards planning may be found in any one organization at any one time. Nevertheless, one of these attitudes usually dominates the others in both individuals and organizations. Later, he categorizes into four parts the ways in which problems can be treated by these groups: 'absolving'; 'resolving'; 'solving'; and 'dissolving' (Ackoff et al., 1984). The following excerpt is a brief review about these characters to put some definitions to make an easy comparison between them. An emphasis has been made, by the thesis, on the forth characteristic which can be observed in indigenous societies who have been sustained for centuries by having clear ideas about their future as well as their past.

1.A.4.1. Inactivists

This is a personality type which is satisfied with the way things are and the way they are going. Its management philosophy is 'conservative' in that it seeks stability and survival, believing that the most apparent social and environmental changes are either illusory, superficial, or temporary. Its organization requires a great deal of activity to keep changes from being made, requiring that all important decisions be made at 'the top'. This personality type takes a position on an issue only when forced to. Feasibility is the principal criterion used by inactivists in selecting means. Ends are more likely to be fitted to means than the converse. It chooses ends that are appropriate to most available means, instead of adjusting means to ends. It tends to want what it can get rather than try to get what it wants, doing as little as possible when intervening in the course of events. It has a greater fear of doing something that does not have to be done than of not doing something that should be done. Therefore, it tends to react to serious threats, not opportunities.

Inactivists are 'problem absolvers' who try to ignore problems in the hope or expectation that they will go away or be taken care of in the natural course of events. They believe that interventions are likelier to intensify and extend the duration of problems than leaving the problems alone. Problem absolvers resist the temptation to act until their survival or stability is threatened - until there is a crisis. Therefore, they practice what is known as 'crisis management'. Crisis managers do as little as possible to remove crisis; they do not address the problems from which the crises arise. These people are clearly conservative and inactive; they resist and try to prevent change trying to maintain things as they are. Although they do not usually claim that things are as good as possible, they believe that things are as good as we have reason or right to expect.

1.A.4.2. Reactivists

These prefer the previous state to the one they are currently in and they believe things are going from bad to worse. Therefore, they not only resist change but they try to unmake previous changes and return to where they once were. They are generally nostalgic about 'the good old days'. Their tendency is to return to the past making their management philosophy 'reactionary'. Their orientation is remedial, not aspirational. Technology is the reactivists'

principal scapegoat for whatever ills they perceive; this is because technological change is so evident and because the past has always had less technology than the present. In this, they have a stated preference for art as against science: the art of muddling through to the science of management. In dealing with problems, they rely on common sense, intuition, and judgement based on long experience, the longer the experience, the better. They believe experience is the best teacher and the best school in the school of hard knocks. For this reason, they place high value on seniority, immobility, and age and so allocate status and responsibility proportionately thereto. Reactivists dislike complexity and try to avoid dealing with it. They reduce complex messes to simple problems that have simple solutions - solutions that are 'tried and true'. They are panacea-prone problem solvers, not planners. They try to create the past by undoing the mess they believe the planning of others has wrought.

Reactivists are 'problem resolvers' who try to select a course of action that yields an outcome that is good enough that 'satisfices'¹. Their approach to problems is clinical. They treat each problem as unique and rely heavily on past experience and trial and error in treating problems. Problem resolving is qualitatively, not quantitatively, oriented. It makes extensive use of subjective judgements and common sense. Problem resolvers occasionally make use of research, even quantitative research, but they seldom use it exclusively or allow it to play a decisive role. Problem resolvers attempt to reconstruct a previous state in which the problem they are facing did not exist. They look for the cause of a problem, and try to remove or neutralize the cause so that things can go back to how they once were. Because they react to problems and try to treat them by returning to a previous state, they are 'reactionary'.

Most decision makers in government and private enterprise are problem resolvers. They defend this approach by citing the lack of time and information that other approaches require. They also argue that real problems are so messy as to render more sophisticated approaches infeasible. Furthermore, they claim their experiential approach to problems minimizes the risk of making a serious error of commission, doing what should not be done. They are less concerned with errors of omission, not doing what should be done.

¹ The word 'satisfice' is coined by Ackoff (1974) to show Inactivists' orientation.

1.A.4.3. Preactivists

These are not willing to settle for things as they are or once were. They believe that the future will be better than the present or the past. How much better, depending on how well they get ready for it. They want more than survival. They want to grow, to become better, larger, more affluent, more powerful, in a sense, to optimize. They are not only concerned about doing something wrong but also about not doing something right, attempting to identify and deal with problems before they become serious and, if possible, before they arise. Therefore, they are preoccupied with forecasts, projections, and other way of obtaining glimpses of the future.

Preactivists believe the future is essentially uncontrollable but that they can accelerate its coming and control its effects on them. Therefore, they plan for the future; they do not plan the future itself. Their planning and problem solving is based more on logic, science, and experimentation than on common sense, intuition, and judgment. They seek to solve problems and exploit opportunities more through research and development than by individual and institutional change. They are interested in hard ware, rather than soft ware, interested in things, rather than people. When they must deal with people they prefer to deal with them collectively, because they believe collective behaviour is more predictable. They tend to perceive the environment as constraining rather than as enabling. Preactivists' management philosophy is 'liberal', in that they seek change within the system, but not change of the system or its environment. They are reformers, not revolutionaries, seeing planning as a sequence of discrete steps which terminate with acceptance or rejection of their plans. What happens to their plans is the responsibility of others.

Preactivists are 'problem solvers' who try to do as well as possible, to optimize. They are research oriented, making heavy use of scientific method, techniques, and tools. They are disposed to quantitative procedures, experimentation, observation, and measurement. They denigrate the subjectivity of the clinical approach and aspire to complete objectivity.

Those who try to solve problems tend to be liberals, seeking to reform the problematic system to take advantage of the changes that are inevitable. They try to do so by predicting change, preparing for it, and accelerating it when possible. They are preactive, seeking to exploit

changes that cannot be avoided, they think change is inevitable and continuous, and they focus on minimizing errors of omission, or lost opportunities. This approach to problems is favoured by technologically oriented management scientists, whose organizational objective is not 'survival', as it is for problem absorbers, or 'revival', as it is for problem resolvers, but 'growth'.

1.A.4.4. Interactivists

These are not willing to settle for the current state of their affairs or the way they are going, and they are not willing to return to the past. They want to design a desirable future and invent ways of bringing it about. They believe we are capable of controlling a significant part of the future as well as its effects on us. They try to prevent, not merely prepare for, threats, and to 'create', not merely exploit, opportunities. The future they argue, depends more on what we do between now and then than it does on what has happened until now.

Interactivists are not willing to settle for survival or growth. They seek 'self-development', 'self-realization', and 'self-control': an increased ability to design and control their own destinies. They are neither satisficers nor optimizers; they are 'idealizers'. They plan to do better in the future than the best that presently appears to be possible. They pursue ideals that they know can never be attained but that can be continuously approached. Thus to them, the formulation of ideals and the design of idealized futures are not empty exercises in utopianism, but necessary steps in setting long-range direction for continuous development.

Because of accelerating rates of technological and social change, interactivists try to design the systems they control so as to increase their ability to learn and adapt rapidly. They maintain that experience is no longer the best teacher; it is too slow, too ambiguous, and too imprecise. Therefore, they attempt to replace experience by experimentation wherever possible. They try to design the implementation of every decision as an experiment that tests its effectiveness and that of the process by which it was reached. They are willing to modify a system's structure, functioning, organization, and personnel as well as its allocation and use of resources. They try to induce cooperative changes in environing systems (which can be explained by supply-demand paradigm), changes that are as fundamental as those that seek the systems they can control directly (which can be explained by production process paradigm).

Interactivists consider technology to be neither good nor bad in itself, but to have a potential for either. Its effects, they believe, depend on how people use it. They view behaviour and technology as interrelated aspects of the 'sociotechnical system'. They treat science and humanities as two aspects of one culture, not as two cultures. Like the head and tail of a coin, these aspects can be discussed or viewed separately, but they cannot be separate. **According to them science is the search for similarities among things that are apparently different, and the humanities are the search for differences among things that are apparently similar. Scientists seek the general and humanists seek the unique.** They are radicals in that they try to change the foundations as well as the superstructure of society and its institutions and organizations.

Interactivists are 'problem dissolvers' who try to change a system to remove the problem. They idealize rather than satisfice or optimize; that is, their objective is to move the system involved closer to its ultimately desired state, its ideal. They take a design approach to problems, redesigning the system involved so that it can control as much of its future as possible and respond rapidly and effectively to those changes that it cannot control. Problem dissolvers try to help those who have a problem to do better in the future than the best that can be done now. They do this by designing their currently most desired future and inventing or finding ways of approximating it as closely as possible. Problem dissolvers are interactive; they change how systems interact with their environments and how their parts interact with each other. Both the system's structure and its functioning are changed. These changes are radical, directed towards 'development', not growth. Table 1.A.1 summarizes some general characteristics of these groups in a way to help the readers viewing Ackoff's suggestions about management in a holistic approach.

Attitudes	Orientation	Objectives	Management	Research	Policy	Problem solving	Characteristic
Interactivists	Idealizer	Development	Radical	Qualitative	Revolutionary	Problem Dissolver	Creation
Preactivists	Optimizer	Growth	Liberal	Quantitative	Reformer	Problem Solver	Exploitation
Reactivists	Remedial	Revival	Reactionary	Qualitative	Clinical manager	Problem Resolver	Re-creation
Inactivists	Satisficer	Survival	Conservative	Quantitative	Crisis manager	Problem Absolver	Conservation

Table 1.A.1 The table is constructed by the author to enable him to compare, at a glance, the different attitudes of the managers suggested by Ackoff (1974 and 1984) [see also Islami (1995)].
Source: the author

Inactivists and reactivists at best treat planning as ritual or prayer that may bring the intervention of a superior force in the course of events. They do not view it as a process which directs one's own intervention. Preactivists planners try to accelerate the future and control its effects on the system they plan for, but they do not try to redirect it. Interactive planners do. Preactive planning deals with products rather than producers. For example, a preactive urban transportation planner tends to assume continued growth of demand for automotive transportation and no significant change in the nature of the automobile. These, s/he assumes, are out of her/his control. Therefore, s/he tries to reduce projected future congestion by increasing the number and size of streets and roads and by expanding other modes of travel. The interactive planner, on the other hand, considers such things as changing the automobile and the city so that the demand for transportation and roadways is modified. S/he attempts to manipulate the producers of problems as well as their effects.

The short-to-medium range future receives the attention of the preactivists. The interactivist gives more attention to the long range because s/he believes that short-run gains are frequently paid for by longer long-run losses, and long-run gains are often preceded by short-run losses. Therefore, s/he believes it is essential to seek a proper balance between long-and short-run consequences of current behaviour. The ability to perceive and be governed by long-run consequences is the essence of 'wisdom'.

Despite the obvious bias in the characterization of these four postures, there are circumstances in which each is most appropriate. If the internal and external dynamics of a system is taking one where s/he wants to go and is doing so quickly enough, inactivism is appropriate. If the direction of change is right but the movement is too slow, preactivism is appropriate. If the change is taking one where s/he does not want to go and one prefers to stay where s/he is or was, reactivism is appropriate. However, if one is not willing to settle for the past, the present, or the future² interactivism is appropriate. The bias for interactivism derives from the belief that their society can be much improved and that it is not tending to improvement and qualification. Their intervention is, therefore, required especially when people's productive

² That appears likely to be the case in Iran nowadays, i.e. after the Islamic Revolution. (See Chapter Five: 5.B for more details.)

power, as the end and the means of the development, is their main participant.

As it has been mentioned before, the ability to take the corrective action required to learn and adapt, according to those who believe in system view, depends on the flexibility and changeability of the control and controlled systems. Most goal-seeking and purposeful systems, including private organizations and public institutions, seek stability³ and therefore resist change. The procedures by which they do so were accurately described by C. N. Parkinson (1957) who says that **it is possible to design flexibility into mechanical (hence passive) systems but it is much more difficult to design it into purposeful systems.**

1.A.5. Purposeful Systems and the Problems

Before moving on to describe more problems dealing with the management of purposeful systems, it would be worthwhile to refer to another issue cited by Ackoff (1974, p. 32): "Purposeful systems not only need to deal with problem-systems, but they also need to maintain and improve solution-system, plans, under changing conditions. Hence, problem solving and planning have come to be conceptualized as continues directed at approachable but unattainable ideals. Absolute truth and perfect efficiency are never obtained but we can always move closer to them."

In management and control of purposeful systems, how to increase the effectiveness with which they serve their own purposes; the purposes of their parts; and they serve the purposes of the systems of which they are part, will be possible by solving three central problems as:

1. self-control problem;
2. humanization problem; and
3. environmentalization problem.

The self-control problem consists of designing and managing systems so that they can cope effectively with increasingly complex and rapidly emerging sets of interacting problems in an

³ The concept of an internally generated 'structural stability' is comparable, and may be contrasted, to the 'stability' and the 'homeostasis' of system theory (see Hillier et al., 1972 -73 and Chapter Three: 3.B).

increasingly complex and dynamic environment. The humanization problem consists of finding ways to serve purposes of the parts of a system more effectively and to do so in such a way as to better serve the purposes of the system itself. Finally, the environmentalization problem consists of finding ways of serving the purposes of environmental systems more effectively and to do so in such a way as to better serve the purpose of the system itself (Ibid.).

1.A.6. Culture, Problem Solving and Design

Designing and management systems, in the self-control problems, can cope with interacting problems in an increasingly complex and dynamic environment. For instance, the purposes of each individual and society can be formed not only by supportive systems but also by culture, while they are trying to cope with the problems. To do so, Aspinall (1994) claims that culture plays a central role in the use and development of schemata. He suggests that cultures contain a residue of schemata for different circumstances. For almost every human activity, for example, learning a language, building a piece of furniture or solving a mathematical problem, the individual's culture provides examples of what works. It seems to be the same for design. It is not necessary to reinvent the wheel each time a problem emerges. It is conceivable to begin with inspired adaptations of what already exists, because many problems we face have been faced by others. Understanding cultural solutions is the fast track towards gaining competence which is dealt with in Chapter Four: 4.A & 4.B.

When new problems arise which cannot be solved with existing schemata, individuals experiment with possibilities based on their old ideas. When a new 'solution' arises it can be added in an evolving way to the existing cultural repertoire. Referring to one characteristics of design process which indicates its potentiality of solving the problems, Hillier (1972) suggests that the real distinction is not between rational and intuitive design but between reflexive (innovative) new solutions and non-reflexive design based on standard solutions. He says that culture and traditions provide the essential base of knowledge from which new ideas are derived. According to this idea, designers are not isolated individuals living in cocoon. They are members of a culture with access to its past and with conscious and unconscious schemata for action. For example, there is no need for a person consciously thinks about the forces of balance when s/he rides a bike. S/he gets on and rides it, with schemata of action to

correct balance if s/he is falling over (see also Chapter Four: Culture as a Complex Whole).

Furthermore, there is a need for accommodating the natural responses of people. They have very deep cultural schemata - special to their own group - evolved both as a response to crises but also to the natural environment in which they happen to be located. They have their own institutions, organizations, etc. to solve their problems even though they are not easily required by outsiders. Many native societies do not resolve their problems through formal organizations, institutions or what so ever. Ujam (1995) suggests that Their organizations are the organization of the values themselves. They use values to generate all their activities and behaviours and responses (see Chapter Four: 4.B).

1.A.7. The Social Problems

If one intends to design and improve the quality of life, one must make it clear how the state of a society's affairs differs from that of earlier societies. Because of an increasing rate of technological change, social and environmental crises are generated and come to a head more rapidly today than at any previous time. Apparently, this is more dominant in most industrial countries and modern civilizations than the rest of the nations. Therefore, they require social responses that are quicker and surer than were required in the past. Some argue that their societies do not provide them, because their structure and functioning do not facilitate rapid response. Therefore, their lack of responsiveness to crises generates discontent among a growing number of their members, discontent that manifests itself in disruptive protest, civil disobedience, or alienation from society. Because the situation in Developing and Underdeveloped Countries are similar to the previous decades of Developed Countries and also because of the logical points in the discourse, the author would like to refer to Ackoff's (1974, p. 4) illustration of these kinds of problems: "Our society responds more rapidly to disruptions than it does to the crises [as a cause] that produce them, and it often does so with repressive measure. These, in turn, stimulate further protest and disobedience. The cycle - protest, repression, protest - either intensifies or dissipates in indifference. Either outcome leads to social disintegration."

Because of the rapid and extensive distribution of news that has been made possible by

advances in communication technology, some believe that the world is still approaching what, 35 years ago, Marshall McLuhan (1964) called a 'global village'. By the definition cited above, it would be acceptable to say that in this village public issues and pressures built up rapidly, requiring governments to respond more quickly than they ever have in the past. There are still differences between centre and periphery of this uniformity and between industrial societies and the other nations. In nonindustrial societies the government means to produce the interest of the whole nation or society through organization, behaviour, structure and what so ever. But, the problem with the centralized government is that it imposes a global uniform perception of the different places of the country itself, rather than setting a policy which is the synthesis of diversities. In addition, concentration of power in the hands of an unresponsive or ineffective government fertilizes the seeds of civil discontent and disobedience. Such disobedience, in turn, usually evokes repressive measures by government, which stimulates more discontent. **The result is an increase in law and a decrease in order which is the case in many Developing Countries in their hasty development and creates a growing gap between people and the governments.**

1.A.8. The Development Problems

There is a growing realization to see development as a goal or a process which involves causal relationships. Unless we understand what development means, both in terms of goals and in terms of process, there are likely to be problems. Although, different world views and philosophies in defining development problems and their solutions, as currently used in different disciplines, refer to cause-effect as a fundamental relationship between phenomena (see Chapter Four: 4.B), but it is worthwhile to have a discussion on their applications.

1.A.8.1. The Environmentalization Problems

Many commentators in the West claim that the so-called highly developed societies of today are the first dominantly urban societies in history which most of their members are living in environments that are more manmade than natural. Mismanagement of these 'artificial' environments, which are the result of the acts to bring the possible theories into the actual achievements (e.g. environmentalization), has significantly increased the rate of decline of the natural environment. They also indicate that life-supporting capabilities of the natural

environment are being reduced at an increasing rate, consciously by Advanced Countries and unconsciously by Less-developed Countries which are mostly under the influences of the former countries' plans and strategies.

1.A.8.2. Development and the Problems of Distribution

It may be added that a small number of states, equalling some 20 percent of the world's population, controls 80 percent of the world's wealth (Ward, 1968). "By 2025, per capita income (in 1990 dollars) in the Developed Countries would double to \$40,000, while in the Developing Countries average per capita income would treble to around \$5,000. Such a development path would cause the income gap between the Developed and Developing World to narrow only slightly in relative terms, and to increase in absolute terms."⁴

1.A.8.3. Disruption and Developed Countries

Another key point of comparison between the industrial societies and the others is that in Poorly Developed Societies, for example, it is difficult to disrupt communication and transportation. In well-developed Countries a few well-placed bombs, aircraft hijackings, and kidnappings can create widespread inconveniences and require costly and time-consuming countermeasures. New tactics of protest have made it possible for a little activity by a few to have a large effect on Man.

1.A.8.4. Are the Resources the Main Development Problem?

In relation to the development problems Ackoff (1974) quotes from U Thant, Secretary-General of the United Nations (1961-1971), who pinpoints that financial resources are not the problem. He mentions that **for developing a country it is no longer resources that limit decisions, it is decision that manages the resources.**

1.A.8.5. The Developed and Underdeveloped Countries

It is characteristic of Developed Nations to believe that they understand development and that

⁴ United Nations Department for Policy Coordination and Sustainable Development (DPCSD), 1997, The document has been posted for the Commission on Sustainable Development, Fifth session, 7-25 April 1997, Item 4 of the provisional agenda

this understanding can easily be transferred to so called Less-developed Nations. But, there is not single instance of a Developing Country being responsible for the elevation of an Underdeveloped Country to the condition of development. Some proposals in Developing Countries suggest that the problem of development is not just getting access to or possession of the resources they think Under-developed or Developing Countries need. But, it is enabling them to use what resources they have and can get in a way they believe will most accelerate their development as they conceive it.

1.A.8.6. Technology and The Development Problems

The exploration of the relationship between technology and development may help us to achieve better understanding of the complexities associated with development and facilitate identification of some factors that can encourage acceptability of cultural values and self-development among planners and designers. It will be discussed in the following chapters that development is not just a matter of applying technology to our problems. Technology is not a guaranteed forerunner of development. Forbes (1969) points out that technology is not culturally neutral. He says: "It is a product of Western ideas and value judgments which without many of the impulses guiding it would be meaningless or even destructive." The imposition of technology on an indigenous culture could be disastrous to that culture. It can lead to, he says, collapse of the class and structure on which such a civilization depends. It can also make a small minority of rich people richer and the large majority of the poor poorer. Earth Summit+5 (1997), Islami (1997b), Epskamp (1992), Garofoli (1992), Human Development Report (1991), Jatoba (1987), Stöhr et al. (1981), Ackoff (1974, 1984) and many others suggest that **Development is the desire and ability to use what is available to continuously improve the quality of life. This ability cannot be given to others even by those who have it. It must be developed in and for oneself. Therefore, development must begin with the desire to improve one's lot** (see also Chapter One: Section 1.B).

Initially it seems that at least the more successful and effective the plan for development is, the more educated its generators are. In this regard, a major problem is that the inhabitants of Developed Nations have shown a remarkable ability to change their environments to suit their needs and desires, but much less ability to change themselves to learn how to adapt and

suit their environment's needs (Earth Summit+5, 1997). In relation to the history of aid from Rich Countries to the Poor Nations, Ackoff (1974, p. 222) went on to admit the fact that the Advanced Countries had not got remarkable success in solving underdevelopment messes: "If we give up the assumption that we have solutions to the underdevelopment mess and that, if we do not have them, we can find them, then it is still possible that we can educate enough members of Less-developed Countries to enable them to solve their nations' problems on their own. We have, of course, been trying to do so for years without conspicuous success."

1.A.8.7. Development and The Problems of Education

Despite huge investments in education in the so-called Developing or Less-developed Countries, the objectives of formal education are not being met; the system produces high expectations and aspirations that many people cannot achieve. The school system, for example in Iran, carries the message that all children, if they study hard and succeed in their examinations, have a chance of getting a highly paid job that will enable them to have the material comfort of their desire. Although, there is evidence, from the survey employed in Mobarakeh Isfahan (1983), suggesting that most of the students in the rural areas are not able to finish the primary school, thus they remain either unemployed in the suburban or simple worker in service sector. The conspicuous result of the centralized education is that none of these students go back to the work in their villages. Moreover, as happens most of the time, after the students have obtained their academic qualifications, they cannot find suitable employment. In addition, because of the emphasis in the curriculum is on academic subjects and intellectual effort, as opposed to practical subjects, the school also carries the hidden message that physical work is not important, even if the vast majority of those who pass through school must earn their living through physical work.

Moreover, in relation to the development programmes many believe that the universities in Less-developed Countries seek to emulate those in Developed Countries almost without exception. One of the problems in most of these countries is that there is very little attempt to adapt higher education to national needs. This due in part to the fact that the textbooks used are generally those written in Developed Countries, and in part to the fact that faculty status derives from publishing in prestige journals of Developed Countries. As a result, higher

education in so called Less-developed Countries is often more relevant to life in the so called Developed World than it is in the country in which it is provided.

It is not possible to teach others to develop themselves than to show them the actual process of it and give them the opportunity to experience it themselves (Ackoff, 1974). One cannot learn how to swim by watching others do so or listening to them talk about doing so. One can only learn by practice. If one practices then watching others, and listening to them can help. Learning how to develop, like how to swim, requires trying, failing over and over again, and eventually succeeding. **The role of the development programmes should give others an opportunity to learn by practice, encouraging them to do so, supporting them during their failures, recognizing success when it is obtained, and serving throughout as a resource that the learner should learn how to use effectively and that should be available to her/him to use as s/he sees fit.**

1.A.8.8. Decreasing Morbidity and Increasing Life Expectancy

With advances in sanitation and medicine, people are living longer. While the world's population has been increasing, death rates have been decreasing. Increasing life expectancy is known to be largely due to medicine's growing ability to cure cardiovascular diseases and disorders, the largest cause of adult deaths. At the same time, it has become more effective in preventing and treating infectious diseases such as pneumonia, which has been a major cause of death among the elderly (Ackoff et al., 1984). Although many kinds of diseases are diagnosed in this century which are seriously dangerous, but it seems acceptable to refer to decrease of the mortality as a strong evidence for the increase of population in the world.

1.A.8.9. The Economic Problems and Development

The process of economic development involves the creation of new consumption desires, which in theory will persuade people to work harder or more efficiently, so that they can earn more and thus satisfy their increased demand. At present in many Developing or Less-Developed Countries many factors tend to increase people's desire and their expectations for material things and social status faster than the society and the economy can possibly satisfy them. The examples of the elites, the breakdown in traditional values and beliefs, the formal

school system, all tend to widen this gap between expectations and reality. Besides the actual programming or content there are also advertisements urging people to buy more luxury goods or status-creating demands for things which cannot be satisfied (Whiteley, 1993). [See also Chapter Two: Design Process (2.B)]

Economic and social conditions in many of Third World Countries are unstable, and various attempts to superimpose a highly developed capita-intensive industrial system upon such conditions have worsened the problem of poverty. Economic and social development in the rural areas, where most of the poverty in these countries is concentrated, have been suggested to be fruitful based on a bottom-up development or the like, that allows for indigence social and cultural realities (see the section about development in this chapter: 1.B).

1.A.9. The Problem

The references mentioned so far obviously suggest that problems are conceptual constructs from complex situations. Solutions are also abstractions which require control, i.e. continuous maintenance and improvement. Although the earlier discussion was not intended to explore all the analytical dimensions, but it revealed in short that without attributing a problem to its appropriate situation solution might lead to further problems. In this regard, the study will attempt to classify the problems into a new category, based on four stages of production process⁵, to show the importance of the new relationship and to identify the main and dominant concept which determines the real problem, as the followings:

1. those problems which are subjective; [consist of theological aspects (e.g. goals, purposes, choices, free will, etc.); world views; philosophical issue; politics (considering certain time and certain place); and cultural and psychological aspects (individual and social). These are all conceived as soft ware for any intentional process. World views, philosophies, cosmology, knowledge (of coping with the environment), being aware of causes, e.g. the needs, satisfactions and dissatisfactions, sense of belonging, authority and freedom, purposes and aims, strategies and policies,

⁵ Ultimate cause, subjective cause, objective cause/effect and formal cause/effect are the four stages of the production process paradigm which are explored in Chapter Four: 4.B.

values and cultural aspects, amenity and the like are different factors which can be located in this level. Moreover, it is necessary to mention that, according to the model of endogenous development, which has been described in Chapter Four: 4.B, any confusion and difficulty in this layer will affect the other layers, therefore, the development plans and strategies.]

2. the problems related to professionals and agencies in different disciplines; (these professionals have a role as a mediator between Man and environment, using their skills in design, planning, management, problem solving, etc. They usually try to solve problems according to people's needs and people's understanding of situations, therefore, predicting the future and designing for it to avoid more problems. It is necessary to point out that methods needed to transform these concepts into the products may also cause problems. Furthermore, briefing the orders, which form the strategies of these disciplines, are mostly dependent on the demands which are generating in the first layer.)
3. the problems related to the materials, resources and circumstances as a means; (e.g. labour forces, time, energy, economy, science, technology, techniques, ecology, nature, environment, etc. Here, the problems manifest themselves into the different types by reference to different characteristics of those resources, i.e. quality and quantity, differences and similarities, richness and poverty, availability and opportunity, sustainability, regeneration and revitalization of the resources, etc.) and
4. finally, the fourth layer involves those problems which relate to the built environment and/or artifacts. (Validity of the product, the pattern of exchanging, consequently evaluating, changing and progressing them, the wastes of their outcomes and their influences on environment or other systems are important issues in this layer.)

To sum up the conclusion of this discussion, it is time to suggest that because the relationship between these layers (production process) is very important, any disturbance or problems related to it will be a matter of significance and need serious consideration. **This implies that**

a single problem in each layer of this classification will create the major problems for the process between them. Furthermore, each problem relates to the other problems, thus creates a system of problems in a slice of time. In turn, it causes problems for the other layers, accordingly for the process itself. It is conceivable to find many examples of this nature in our daily life. For instance, the problems related to environment and situation in which a building should be constructed (layer 3) will affect the process of its production (layer 4) as well as misunderstanding of people's needs and wants (layer 1) and deficiency of professional organizations and agencies (layer 2).

Another important matter is that by solving the problems of each layer, the main problems, which refer to the production process, might not be solved. For example, improving or enhancing the building materials will not necessarily end to a good or comfort architecture. There is a need for solving other problems related to the user's needs or wants, manipulation of the concepts and implication of designs. So, **two major factors should be considered in the intentional process of producing material or nonmaterial products: time and the relationship between the components at each level of the process.** If this relationship is constructed, many problems, which have no solution individually, might be solved. Of course, there is no need to emphasize that in the process of life, concerning evolution of thought or generation of typologies in the built environment, a stable state which is neither static nor dynamic but evolutionary is required as an initiative purpose (see Chapter Four: 4.A).

Until now, this section reviewed some definitions about the problems and their solutions. Now, it seems timely to go about a definition related to the theme of the thesis. As it was discussed, the outward investigation is not necessarily similar to inward perception of the problems. Some of the outward looking problems are not real rather they are manifestations of progress and development of a system. **The thesis attempts to examine a frame work in which problems of this kind should have solutions from within, from their indigenous contexts.** This idea which will be discussed later is extended in Part Two, Chapter Four: 4.B, where for making a model of endogenous development the author refers to both: the generalisation of the findings in actual situations to simulate the paradigms of the model (Kuhnian Approach); and the falsification of the achievements from the literature, which

indicates the possible ideals, by testing them with the actual situation (Popperian Approach). Therefore, the local actual information from within for constructing a world view to trace the real problems and to apply appropriate solutions from one hand and the global scientific approaches for seeking the ways of solving the real problems on the other hand are both necessary factors as the sides of a coin which rely on the actual situations. **This direction from the actual reality towards possible ideal may justify the direction from inward into outward or from 'within'.**

Furthermore, one of the most important issues is to find a way to cope with the environment. Various scholars have diagnosed so called Third World Countries' problems as stemming from historical, economic, social, political and ecological factors with both internal and external dimensions. Varied development strategies and approaches have been offered as solutions to the countries problems. These solutions or strategies range from the large scale infusion of external financial and other capital resources to the new alternative approaches that emphasize small scale programme considering people's participation. **One of these new approaches can be 'endogenous', self-reliance, and sustainable development or 'development from within' which is not necessarily concerned about the scale of the development projects but their directions. So, these kinds of development range from local small scale into global and large scale projects.**

Conclusion of Problem Identification

This section comes to the conclusion that one way of looking at problems is to view each of the four layers or dimensions as almost unified, expressing unity or disparity. Many commentators talk about problems, not as a thing that is either there or not there but as a matter of degree. They talk about identification of problems. The situation may be almost unified across, more or less, of these dimensions and some dimensions may be missing altogether, such as when one talks of development and qualification of life being a problem without a distinct clarification of the ultimate goals. The utility of this approach was shown up when nest reviewing all the descriptions, explanations and definitions of problems to see if they would fit within a framework or not. Not they do so, but the framework shows up missing elements in many of those definitions.

Put it in other way, summarization of the discussion about problem identification shows that Ackoffian clinical analogy is more concerned about systemic view of the problem identification that intends to conduct ways for 'description'⁶ of the problems. In this way of thought, the classifications and categories are not beyond this limitation. For example, four characteristics of professionals whose attitudes start from decision making and finish to design, i.e. start from solving problems and lead to manifestation of different concepts in order to prescribe the problems, are all in this domain.

Although there are many points in system view which are significant, but it seems that philosophy and science of Systems Age are not enough to solve our problems. For example, automation of control systems in the societies refers to the second level of inanimate systems in Boulding's classification⁷ which is not an appropriate model for the societies who are in the higher level of that category. Therefore, it is conceivable to say that dynamic systems cannot explain behaviour of the organic systems, so automation is not similar to the process at all.

There are also some statements of Alexander and Hillier⁸ that identify another methodology capable of 'explaining' the problems. It seems that they rely more on the scientific methods to analyse the roots of the problems while the process or activity pattern is concerned. It might be classified in a way Kuhnian paradigm is seeking the scientific problems [see Chapter Four: The Model (4.B)]. **The attempt in this thesis is to emphasis on the 'simulation' of the problems that might lead to investigation of their origin to prevent deterioration, i.e. to dissolve the problems by observing them in the process.** There is also another concern about the problems which provides tools for comparing them with each other by an appropriate criterion to realize the real problems. This may be achieved by considering the term 'evaluation' that is also used in the survey in Chapter Six, i.e. the Questionnaire, in order

⁶ Chapin (1984) suggests these four stages for the study of the urban structure, i.e. 'description', 'explanation', 'simulation' and 'evaluation'.

⁷ This classification consists of two parts: closed systems or inanimates (statics, dynamics and cybernetics) and open systems or animates (cells, plants, human being, societies and abstract systems) which is discussed in his paper: 'General Systems Theory - The Skeleton of Science', 1956.

⁸ The terms 'diachronous' and 'synchronous' have been used by Hillier et al. (1972-73) to distinguish the real problems.

to help finding a criterion for evaluating the right problem and testing its appropriate solution.

Finally, the earlier discussions revealed in short that transformations of the societies occur either by planning and design or by management which involves decision making, thus, problem solving (Figure 1.A.1). Each of these elements bridges past to future by processing the means whose results may give unity or diversity to the process of life. Whether they work properly or not, this might be one of the real problems. **The focus of the thesis, therefore, is on the problems related to the design process to investigate the solutions which exist in the new built environment and test them within the context of Iran. The case's environmental problems, which are illustrated in Part Three Chapter Five, confirm that the new built environment is not the continuation of the indigenous one, therefore, is not reliable in terms of the costs, identity, durability, ..., and prior to all cannot be seen as a means for development.** The complex story of now is that the 'solution' became a 'problem' itself. With all the wisdom of hindsight, it still seems extraordinary that the original arguments about development omitted such basic concerns.

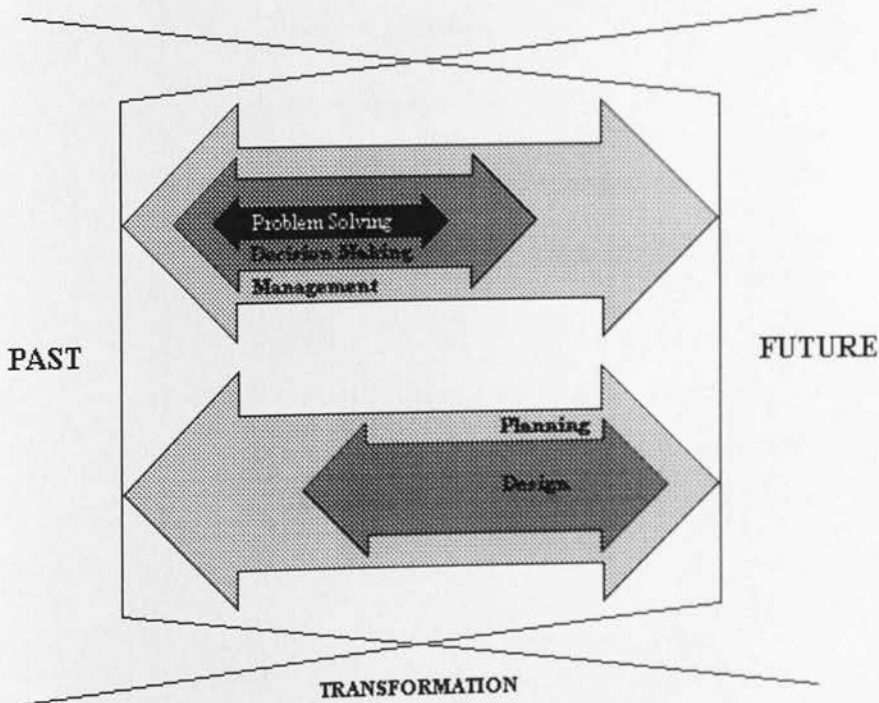


Figure 1.A.1 The functions of management and planning in societies's transformational process
The diagram shows that their tendencies towards past and future are different.
Source: the author

1.B

DEVELOPMENT

Introduction to Development

1.B.1. New Concerns in Development Theories

1.B.2. Growth versus Development

1.B.3. Development and Underdevelopment

1.B.4. Change and Transformation

1.B.4.1. Radical Transformation

1.B.4.2. Structural Changes

1.B.5. The Roots of Development Problems

1.B.6. The Basis for Development Programmes

1.B.7. Development from Above or Below?

1.B.7.1. Indigenous Development

1.B.7.1.1. Towards an Endogenous Development Theory

Conclusion of Development

Introduction to Development

Many issues related to development have a long history, but from a spatial perspective, substantive consideration of them is much more recent. Considerable debate is currently taking place, some of which of a fundamental nature. The present section considers development in different contexts with an emphasis on so called Developing or Underdeveloped Countries that are appropriate for the situation of the case study referred to in the thesis, i.e. Iran. For all social and territorial groups, development is one of the greatest issues of our time. It is hoped that this section will make a contribution towards greater understanding and possibly point the way to new policy solutions.

Following the discussion about problem identification in the previous section (1.A), which involved a brief review of some development problems, this section is also an attempt to concentrate more on the definitions and different interpretations of the word 'development'. The objective and, therefore, the meaning of development has been a matter of continuous debate for some decades among development scholars and still the literature is confused about it. What is significantly important is that not having a clear understanding of the definition of development, in the first instance, could only lead to a series of misconceptions in discussions and conclusions thereafter.

"... everyone, it seems, knows what development is except the expert!" (Stöhr et al., 1981) This is perhaps not surprising because in the ultimate sense development is a reflection of personal values, conditioned by the societal framework in which one lives. **The values a society holds, which themselves change over time, are the ultimate standard by which development or lack of it will be judged. It is perhaps obvious but worth restating that an outside view of a society's 'development' may be very different from an assessment made by that society itself.**

Answering the question 'what is the meaning of development?' a number of generalizations can be made based on new concerns. Ingham (1993, p. 1803) summarises some of them:

- a) the historical dimension; (which is crucial and it is misleading to expect a simple

replication of 19th century industrialization and growth.)

- b) **structural change; (whereby the agricultural sector declines, relative to the manufacturing and service sector, remains important though there may be costs in terms of increased international dependency, unemployment and loss of the traditional way of life.)** [the author's emphasis]
- c) modernization; (which encompasses social, political and cultural changes as well as the purely economic, has many critics.)
- d) the benefits of economic growth; (which are not always distributed equitably.)
- e) criticism of economists; (for having an exclusively 'good-centred' view of development rather than a '**people-centred**' development ethic. **There is an increased focus towards the concept of human development. Decentralization, participation and grass roots rural development are the issues of more interest nowadays.**) [the author's emphasis]
- f) sustainable development; (which was a concept little used by development economists until quite recently, being the preserve instead of environmentalists, conservationists, ecologists and the like.)
- g) political and civil liberties; (which seem to go hand in hand with improvement in the quality of life, as measured by life expectancy, infant mortality and real national income per head.) and
- h) the need of economists to be made aware of the different philosophical perspectives out of which their ethical judgements may emerge.

Ingham then describes these parameters in more details. For instance, she signifies a historical dimension and indicates that after the Second World War, many disciplines operated in an

intellectual environment, believing that development and change would effectively replicate the experience of those countries which had been industrialized during the 19th century, in particular that development would follow the pattern of Britain, France, Germany, the United States and Japan. Taking evidence from these cases, she says, economists stressed the importance of increased savings and capital accumulation in economic growth. Few economists and policy makers are now prepared, however, to make the ready identification of 'economic growth' with 'development'. Indeed, for some today what is seen as the historical process of 'Westernization' may well be rejected outright as a goal for Developing Countries.

Another evidence suggests that historically, the development of most of the currently Advanced Countries was made possible by what Gerald Piel (1966) called 'coercive deprivation'. This involved economic exploitation of a large portion of their own populations or that of other countries. Ackoff et al. (1984) refer to a citation of Alexander Herzen who commented on this process as follows: "In order to develop, it is necessary that things should be much better for some and much worse for others; then those who are better off can develop at the expense of others." The 'some' could be nations as well as individuals, as was the case in much of past colonialism.

Following the discussion about the historical dimension of development and the relationships between poor and rich nations, Wiarda (1983) refers to Western development model and identifies six features of critiques about it:

1. **the bias and ethnocentrism perceived in the Western model and on its inapplicability to societies with quite different traditions, histories, societies, and cultural patterns;** [the author's emphasis]
2. the matter that the stages and sequences of Western social and economic change are not replicable in the third world;
3. not only are timing, sequences, and stages of Third World development likely to be quite different, but the international context is entirely altered as well;

4. **modernization initially imposes the disintegration of traditional institutions which in practice in Third World are useful;** [the author's emphasis]
5. modernising institutions such as trade unions, and political parties may not be meaningful in the Third World, although the Western development perspective tries to keep the Third World within the Western orbit; and
6. finally, perhaps more harmful, in terms of long-term development of the Third World, is the damage that has been inflicted on their own institutions by the Western biases.

Quoting from various scholars (Campbell et al., 1987; Cornia et al., 1988; Ellis, 1987; and Timberlake, 1985) who have diagnosed Africa's problems, Dei (1991) writes that most of the problems stem from historical, economic, social, political and ecological factors with both internal and external dimensions. Several development strategies approaches in Less-Developed or Developing Countries have been offered as solutions to their problems. These solutions or strategies range from the large scale infusion of external financial and other capital resources to the 'new' alternative approaches that emphasize endogenous, self-reliance, sustainable development and/or 'development from within' (Bell, 1986; Bryant et al., 1982; Killick, 1983; McDougall, 1990; and WCED, 1987).

It has been pointed out by Dei (1988) and Posnansky (1980, 1984) that the varied conclusions reached about the state of Third World national economies have been based solely on macro level studies of the cities and their immediate surroundings. Such studies may not give the true and accurate picture of the health of the local economy. For instance, they indicate, there can be no denial that the fundamental economic changes taking place on the African and Asian continents tend to have much greater long-term damaging effect on the cities and urban centres than they do on the rural areas. For instance, the export-led development strategies pursued by some tropical African governments, principally in response to the structural adjustment policies and programmes of the World Bank have made African cities and urban centres more than ever dependent on an expansive, import-dependent social service infrastructure (Campbell et al., 1989; and Zeleza, 1989).

There is also evidence suggesting that as some rural communities confront the harsh realities of current economic and ecological conditions, they resort to or rely on indigenous knowledge and their cultural resource base to help them deal with the stresses on their household and domestic economies (Brokensha et al., 1980; and Warren, 1989). There exist in those communities traditional institutions, structures and processes that have been set up to satisfy basic social needs. These are part of what Jatoba (1987) calls 'non-conventional resources' of society that can be mobilized for alternative social development. They include the cultural resources of rural peoples such as social consciousness and community identity that generate common responsibility, the organizational attributes of the traditional polity, social energy that can be harnessed for self-help projects, and social networks and mutual aid created by shared experiences and historical traditions (Jatoba, 1987; and Matowanyika, 1990).

Moreover, in many communities exploitation is clearly supported by extra regional forces and processes and the removal or reduction of these extra regional forces may weaken the power of exploitative groups in the region, but in many communities, however, there are traditional institutions through which an egalitarian development-from-below approach could operate (Friedmann, 1979). Pradervand (1989) also points out that no serious attempts have been made by development experts and policy makers to examine the importance of such cultural resources for Africa development and that is true for all the Third World Countries development. For most of them, these cultural attributes have been seen as major obstacles in the development process (Dei, 1991).

Some studies show the importance of community to a person's well being and of the role that the cultural resource base can play in social development. Despite all the debates which may potentially predispose outsiders to see a unique opportunity to introduce the necessity of aids to enable Underdeveloped Countries to develop, it is worthwhile to mention that among rural peoples in so called Under Developed and Developing Countries, the struggle for livelihood at both the household and community levels shows the persistence of **the cooperative ideology of domestic production. This ideology is upheld by community members because it enhances the capability for the group's collective survival** (Scott, 1984).

Individuals in the community and its citizens elsewhere have a social responsibility to offer aid and assistance whenever possible to any unfortunate segments of the population that face hardships. There is also a belief and an expectation that such assistance will be reciprocated in varied forms at all times (Hill, 1972; and Lennihan, 1988).

A contemporary observation made by some development experts and scholars is that recent political and economic changes in Europe, East-West relations and the emerging regional economic and political power blocs pose a threat to the economic future and survival of the some Developing and Underdeveloped Countries. There is a concern that these countries would be increasingly marginalized in international processes and relationships, particularly, in an intensified net capital outflows in the coming years (Campbell et al., 1989; and Matowanyika, 1990).

For example, one way of ensuring Africa's survival is suggested to be for concerted efforts (local and international) to ensure that resources, especially those of capital nature, extracted from the continent are redirected to the immediate needs of its people to improve basic livelihoods (WCED, 1987)¹. There is a need for a complementary, if not an alternative development, strategy that focuses on the indigenous cultural resource base of Underdeveloped and Developing Countries to help in strengthening the processes which have sustained them for years (Matowanyika, 1990). According to the citation propounded by Dei (1991), **indigenous cultural resources include 'indigenous knowledge' and the 'cultural attributes' of community bonding, 'self-help', 'mutual aid', 'social responsibility', and a 'traditional polity' striving to satisfy the needs and aspirations of its people.**

With the explanations above, the author argues that **development is a process in which individuals or societies increase their abilities and desires to satisfy their own needs and desires and those of others. It is much more a matter of learning than of earning. It is better reflected in quality of life than in standard of living.** It has become increasingly apparent that the continued economic growth of a nation is not necessarily accompanied by

¹ World Commission on Environment and Development (WCED), 1987, *Our Common Future*, Oxford University Press.

improvements in the quality of life (Ackoff et al., 1984). Because of these kinds of definitions many argue, as Henderson (1978) does, that some of the most economically Advanced Countries are now increasing their standards of living at the expense of quality of life.

This is not to say that wealth is irrelevant to development or the quality of life; it is very relevant. **How much people can actually improve their quality of life and that of others depends not only on the people's abilities and desires but also on what resources are available to them.** Ackoff's (1974) statement should be kept in mind that **resources are more often taken from nature than given by it.** The more developed a country or person, the more resources it has to recognize and develop. Put another way, resources are created by what nature provides. What nature provides is not a resource until people have transformed it or learned how to use it.

1.B.1. New Concerns in Development Theories

Besides those references cited in the Introduction, it is worthwhile looking for some theoretical findings about development theories to see whether in practice there is any common concept among them or not. For instance, a definition is cited by Riddell (1981, pp. 3-4) who believes that the process of development, like the condition of underdevelopment, is an expression with many meanings. He says that some employ the word when 'change' alone is meant, others when they mean 'gain' or 'profit'. He propounds his understanding of the term development as: "... development implies change in favour of general human improvement and change of two kinds usually links: expansion in consumption and enhancement of welfare. Development is, thus, both a material and an organizational matter." In relation to the present situation of so-called Underdeveloped and Developing Countries, the author agrees with Riddell who believes that **the northern prosperity is the result of southern denial.**

Kitching (1982, pp. 6-15) reviewed the history of development theories in his book and claimed that 'internationalisation' is the precondition for development. He brought forward some theoretical and empirical reasons for his claim. Kitching also mentions that there is no consensus about the meaning of development or developing societies. Then, he pinpoints the changes in the economic and social structure of human societies which cause total shift in their

forms of production and ways of life. Talking about the duration of development process, he says that the efforts of governments will not occur over night and for some basic shifts in social practices and in values and attitudes there is a need for considering minimum thirty years and sometimes it may take fifty years or even a century.

A report in the Development Forum (January-February 1989, p. 24), which writes about 'the seven sins' and the scale of development projects, confesses that **most new ideas and plans for development on an international scale have not gone any further than micro projects, therefore, have a minor effect on the communities involved.** The application of the new ideas and technologies to the broader scale, the report suggests, must be the challenge of the next development decade.

Seers (1969, p. 10) sees development from a special angle and writes: "... We cannot avoid what the positivist disparagingly refers to as 'value judgements'. 'Development' is inevitably a normative concept, almost a synonym for improvement to pretend otherwise is just to hide one's value judgement." He then explains that the yardstick for judgement might be taken from the government or history. By the latter, he means that the present situation of some of the so-called Developed Nations, might be perceived as a model for others to copy. This is almost defining development as modernisation. Then, he claims that those rich countries are not necessarily good models since they have many hazards, such as industrial pollution, which are not desirable. In brief Seers's definition of development identifies three elements; first 'sufficient food and shelter', second, 'employment' and thirdly 'equality'. Seers (1977, p. 27) claims: "The time is indeed ripe for another critical look at the meaning of development. ... the essential element to add - as is being widely recognised - is self reliance."

Todaro (1985, p. 86) clarifies three elements as basic components for development. These three basic components or core values, which are 'life-sustenance', 'self-esteem'; and 'freedom', should serve as a conceptual basic and practical guidelines for understanding the 'inner' meaning of development. They also represent common goals sought by all individuals and societies. For him, 'life-sustenance' is the ability to provide basic needs which include food, shelter, health and protection. 'Self-esteem', which is the second universal component of the

good life, is a sense of worth and self respect, or not being used as a tool by others for their own ends². Finally, for him, a third and final universal value, which should constitute the meaning of development, is the concept of freedom.

Mary B. Anderson proposes a definition of development in an 'institute' which was organized in 1984 and sponsored by Harvard University's School of Education to discuss the topic of 'Disasters and Development' in 1985. The proceeding of that institute was published as a supplement to 'Disasters Journal' at the same time. Her explicit idea in page 46 of the article is manifested in the following phrase: "... Disasters are indicators of the failure of development - development is the process of reducing vulnerability to disasters". She then continues to analyse this definition in more depth, saying: "... individuals and societies may be vulnerable in three areas: the material, the organizational and the socio-psychological". She then goes about to explain the dimensions of the productivity in development in page 48:

"Finally, socio-psychological invulnerability must be of equal importance to material and organizational invulnerability, though we know much less about it. ... in another publication, I have suggested that, in addition to the three traditional neo-classical factors of production of land, labour and capital, there is an equally important fourth productive factor: 'ideology' (Anderson 1978). Ideology, when joined with the other three factors of production, may greatly increase productivity in certain situations."

Anderson concludes her discussion by pinpointing the fact that **no nation is yet fully developed**, i.e. invulnerable to all points. She says: "At all fundamental level, the reduced vulnerability definition challenges much of so-called development ... as it has produced new threats to the ecosystem on which all societies depend."

Zargar (1989a, p. 240) criticises Anderson's definitions about development theories by focusing on two points: first, emphasizing on consumption of the natural resources; therefore, he rejects the possibility of going back to a mode of isolated tribal-fashion life, living scattered on the land and in a natural balance with the environment. Secondly, he refers to his

² Human needs have been expressed in greater details in Chapter Four, The Model (4.B).

perception of Anderson's view about development, and states that the base of her definitions of development is on survival or elimination or at least reduction of 'vulnerability'. He then says: "... **Man does not only live to survival, rather in all aspect he is everyday challenging some sort of progress and development.** In another word, for Man it is not enough to survive, it is his nature to move, to discover and explore and to achieve a higher or better degree of welfare, both in a materialistic and in a nonmaterialistic sense." [the author's emphasis] But, the author would like to suggest that indicating the environmental problems by comparing our situations with the past does not necessarily mean that we should go back or have to imitate the past in the sake of present or future, rather it means to learn from our mistakes. Moreover, it is hard to grasp the criteria used in this criticism, which is presumably the real attempt of any research.

Solving some of the development problems, Thurow (1981) discusses about 'economic equity' and 'political equality' in his work. With this line of thought, he tries to create a better state of affairs than what was before by doing what he considers to be the best that can be done. He focuses on what can be done now to improve the future, but not on increasing the future ability and desire to improve the future³. Except his proposal for a parliamentary form of government, the rest are for reform through more government interventions, but not ones that are radically different from those of the past. Their differences are more of the degree than of kind, as it is for most of the preactivists' proposals.

Henderson (1978) argues for the need to decentralize power in her proposal for development. Nevertheless, she proposes major federal programmes for USA to create jobs, control advertising, and allocate national fuel resources, among other things. She, actually, leaves vague the method of implementing these programmes, but their mere existence seems to contradict her desire to disperse power. The reason may be found in national programmes that are centrally administered and are usually sensitive to the same political pressures that produce resistance to change. When such resistance is overcome will of course weaken and mislead the programmes that are carried out.

³ Increasing the future ability and desire to improve the future is one of the Interactivists' objectives.

The author would like to argue that there are many elements of Henderson's (1978) works that might be absorbed in some of the others proposals, for example, **the need to decentralize government, greater participation in public affairs, and less formal organizational arrangements**. There are a very large number of specific proposals as development theories, but they are not brought together into a cohesive and unified design to address development problems. This does not mean that they are internally inconsistent but that they are difficult to grasp as a whole. The role, relevance, and interactions of these proposals are not always apparent and will be thoroughly addressed by the model of endogenous development (see Chapter Four: The Model and Chapter Seven: Conclusion).

1.B.2. Growth versus Development

Because the difference between adopting growth and adopting development as an objective is profound, it is worthwhile to explore their difference. Growth has been said, is a change in size or number. Growth can be negative or positive. Organisms can increase or decrease in size, and populations can increase or decrease in number. Economic growth, therefore, refers either to a change in the size of an economy (for example, its GNP⁴) or a change in measure of its performance (for example, per capita income). Growth usually occurs without choice in most biological systems. However, **it is conceivable to see a society's compulsion to grow as natural, even laudable. Why? Because, there is an assumption that physical or economic growth is necessary, if not sufficient, for development.** Nevertheless, if limits to growth limited development, one could understand a preoccupation with growth.

Development of a person or a society, contrary to what many believe, is not a condition or state defined by what or how much that person or society has. For example, if the goods and services available in the most affluent nation were suddenly made available to an Underdeveloped Country, that nation would not become developed. On the other hand, many Developed Nations can be found that is not possible to asses them by available development indicators. **Development has less to do with how much a person or society has than with what it can do with whatever it has.**

⁴ The Gross National Product (GNP)

1.B.3. Development and Underdevelopment

Development and underdevelopment are interdependent phenomena. The development of every Advance Nation derives at least in part from the exploitation of Less-advanced Nations. For example, Ackoff (1974) signifies this relationship by bringing an example from America and says that until recently the companies of this country produced crude oil in Less-developed Nations and shipped it to the United States for less than they could produce it for their own. The idea that the difference in cost ought to have gone to the country from which the oil was taken crossed few 'developed' minds. After all, it was argued by most of those minds, it did cross, that it was their capital and ingenuity which made the oil fields possible. Without it those countries would have nothing. This is a rationalization of the imbalance of benefits. **Such an imbalance, he says, is exploitation however benevolent it may be.**

Although the potential factors that define the meaning of development in the references mentioned above may help clarifying the relationship between underdevelopment and development, but there is a need for observing the outsiders' views of the problems about so called Underdeveloped or Less-developed Nations. Therefore, in the next step of completing the discourse about the aids for assisting the Poor Nations to be developed, a quotation from Ackoff's (1974, 1984) classification about different attitudes in management (inactivists, reactivists, preactivists and interactivists) has been conducted in Appendix One: Section (b) that will help tracing their opinion about the subject. [See also the section about identification of the problems in this chapter (1.A).]

Summarizing the argument about development and underdevelopment, some prescriptions which have been referred to by many scholars are worthwhile mentioning. For example, it is said that **Underdeveloped and Developing Countries need to develop on their own, to invest their traditional concepts with new meanings, but not slavishly accept the standard of the Industrialized Countries as doctrine of development. They should pioneer their own way of development. They could draw on the experiences of other countries, but modify those models to suit their own indigenous conditions.** So, it is time for the thesis to recommend that emphasis should be placed on developing an economic system, patterns of development, production, consumption, lifestyle, education and mass-

media that are best suited to their own requirements and realities in these countries. Underdeveloped and Developing Countries should look into their past in order to know the present and to predict the future; they must look into both the past and the present.

1.B.4. Change and Transformation

Thurow (1981) stresses the fact that economic problems can neither be understood nor solved without taking account of the political process. He argues that the inability to legislate changes that would result in losses to some, even if most would gain, arises from the fact that they do not have political parties⁵.

Many are sympathetic to Thurow's (1981) objectives of economic equity and political equality. As he says, some societies are engaged in a zero-sum game in which one party's gain is invariably perceived as another's equivalent loss. This win-lose view of social interactions results in bargaining that paralyses those societies. In this respect, most of Thurow's proposals involve reforms - changes of behaviour of the current system - rather than fundamental restructuring of it. The most radical structural change he suggests is to a parliamentary form of government. But, the author would like to suggest that **the solution lies not so much in how centralized decision makers are organized, as in who should make the decisions and how they should be made.**

1.B.4.1. Radical Transformation

Some believe that economic solutions are the most essential factors in the development process. But, Henderson (1978) argues that there is a limitation in economic system's growth. After they stop growing, they will go towards differentiation and maintenance. She claims that competition for previously abundant resources is replaced by cooperation in the use of those that are scarce, and exploitation of the ecosystem converts into its restoration and preservation. There are also others who believe that growth is not necessarily limited.

⁵ A political party is a group that can force its elected members to vote for that party's solution to society's problem. With a majority and minority party, the majority is expected to solve the nation's economic problem. If it can't, it is replaced in the next election, and the minority becomes the majority. Responsibility for success is clear, and failures can be punished (Thurow, 1981, p. 212).

The author of this thesis argues that **the growth is a means, not an end, and is, therefore, an option that should be evaluated concerning explicitly formulated social objectives. Development is considered to be the end that purposeful individuals and groups should seek. Development is not a biological but a psychological and social concept. It is with respect to the potential contribution to development that proposals for 'revitalizing'⁶ societies and their economies should be evaluated.**

There is also evidence suggesting that the economies of More Developed Countries (MDCs) cannot be revitalized without a thorough inspection of their socioeconomic systems; reform will not do that. The thesis supports this idea and agrees with Henderson (1978) who is among these supporters of radical change. In her book, 'Creating Alternative Futures: The End of Economics', she argues that what is needed most to restrengthen our societies and their economies is a change of paradigm, a new perspective, a different way of viewing the world. Policies derived from the old paradigms cannot do the job.

Finally being concerned about the dissolution⁷ of the development problems, The thesis proposes **radical changes in the nature and structure of government and society. The approach seems to approximate to that of designing. Its attempt is to dissolve the development problems by creating the conditions in which there could be no problems. In this regard, the designs are neither cohesive nor directed at an explicitly formulated objective.** [See also Chapter Two: Design Process (2.B).]

1.B.5. The Roots of the Development Problems

The meaning and objectives of development are reviewed according to theoretical reasoning and review of the empirical records. It is surprising that most of the literature about development, which is written by the experts who are actually outsiders to the problems of a specific region, seems simplistic comparing the actual and real comprehensive components of the life in long term or short term development. The author of this thesis argues that **less**

⁶ Revitalizing and redesigning societies and their economies is one of the Interactivists' objectives.

⁷ For having a better understanding of the word dissolution, see Table 1.A.1 which involves other terms like solution, resolution and absolution.

attention has been paid to the complexity of the existing cultural and social situations. Mostly improvement in the standards of life is the main objective of the development programmes and few concentrated on the generation of the plans for development which is the result of the potential power of the indigenous people. Furthermore, most of the reports have been cited by governmental or aid agencies and there is no place of the indigenous people's talk. So, the author suggests that the criteria are dubious in many cases and the interpretations are either the interpretations of people's interpretations or the professionals' interpretations of the real situation which is far from the belief of people.

The scale of development is one of the key points in the discourse. Therefore, it is worthwhile finding the roots of development programmes in a national level to pinpoint the limitations of some organizations, e.g. monopolies or bureaucracies, in the nations. For example, people are working in two sectors: productive sectors (such as agriculture and industry) and service sector (such as health, education, etc.). In practice people are mostly working in the services sector and the desire for a variety of services probably continues to increase. There is a belief based on the current high cost and low quality of many services in many parts of the world. People who need or want these services feel that they are not worth their cost. Whatever service they purchase has some value to them, but so does what they pay for it. If the value of the service they receive is less than the value they give up to obtain it, their wealth is reduced. The acquisition of many services is widely perceived as wealth decreasing rather than wealth increasing. Two examples of this are public education and health care.

Therefore, eventually a monopoly's or a bureaucracy's cost of providing a service exceeds the service's value to those who pay for it. Because, consumers of publicly provided services usually do not pay for them directly or have no alternative sources, the unreasonable cost is not apparent. However, the poor quality of service is usually clear. Ackoff et al. (1984) refer to one of these phenomena and claims that monopolies and bureaucracies are seldom grateful for the demand that justifies their existence; they tend to treat their consumers with disrespect, habitually delaying and otherwise inconveniencing those who come for the service that is their due. Because government and private agencies are using these kinds of organization, i.e. monopolies and bureaucracies, or are parts of them and are affecting development

programmes, a brief definition about them has been cited in Section (c) of Appendix One.

1.B.6. The Basis for Development Programmes

Although development programmes are not limited to a certain situation, the results of the First and Second United Nations Development Decades have shown quite clearly that the adoption of alien patterns of development, production, consumption, life-styles and education are at odds with the solution of problems as complex and deep-rooted as those faced by many Underdeveloped and Developing Countries.

Most development plans have by-passed the rural areas. For example, between 80 and 90 per cent of the population of Third World Countries live and work in the rural areas. The author argues that the necessity of recognizing the foreseeable future, when the great mass of the population of Third World Countries will be subsistence farmers, therefore the importance of the agricultural base should be remembered. It is only then that agricultural productivity can be brought to the level at which a sustained policy of industrialization is possible. Therefore, the base of development should be rural, not urban. For more clarification about this line of thought, a relevant discourse has been constructed in Section (d) of Appendix One, i.e. Basic Approaches to Development Programmes.

1.B.7. Development from Above or Below?

The need for an approach to help understanding of people's transaction with their environment which is based on culture and history as well as economic factors calls for a new definition of development which the author would like to go for it in the present discussion. Garofoli (1992) describes the externally planned 'top-down', 'development from above' model of regional development, typical of the 1960s and 1970s, as if they generally failed to stimulate economic growth in the backward regions of Southern Europe. Because the production organization characterising developed regions, based on large firms and modern sectors, had no connection with the culture and historical 'milieus' of the areas into which they were introduced. He then signifies that the need for a different approach to development theory and policies has matured into an alternative 'development from below', based on small firms, local resources and local agents. In this regard, he suggests a feature of the new patterns which is

the co-presence of small firms and small towns with an articulated social structure instead of large firms and urbanization.

Development from below argues for flexibility and is as much an ideology as a strategy. It is a way of looking at development as a dynamic process rather than a rigid set of policies and ideas. In practice, there are many responses to it over both time and space. Penouil (1981) argues that one of the greatest errors of the last decade has been to portray centralization and decentralization, or polarization and balanced growth, as being contradictory rather than complementary.

The scale at which 'development' is analysed is also critical. The nation-state has been used as a framework in some writings but in Third World settings some of these are relatively the creations of previous decades and may still contain several 'societies' with different value systems (Stöhr et al., 1981). The thesis sees differences in a actual extent which are also great but perhaps it is difference in population which is more significant in development terms, **as development in the final analysis is about people not places**, although people seem to require a certain degree of territorial identity in order to live harmoniously in society.

Schumacher (1973) used the phrase 'Small is Beautiful' in the title for his book; other authors, in word of Webber (1979), feel that small may be beautiful but big is bountiful! Development from below argues essentially for a development which is determined at the lowest feasible territorial scale. Much has been written about the economics of scale; relatively little about how small a unit need to be, to be viable in a developmental sense (Stöhr et al., 1981). In the later discussion about the model of endogenous development in Chapter Four, the author will argue that the scale of development plans has no essential role in forming the model. However, the scale of analysis is not the only, or even the most significant aspect of development from below as well. The same source points to the fact that inherent in development from below are certain basic values. It counts these values as:

"First, it is a development determined from within by the people of that society themselves, based on their own resources - human, physical and institutional.

Each strategy is, therefore, unique to the society in which it evolves. Secondly, it is egalitarian and self-reliant in nature, emphasizing the meeting of the basic needs of all members of society. It is, therefore, communalist (Friedmann, 1979) in nature. The ultimate aim of such a strategy is an improvement of both a quantitative and qualitative type in the life-style of all members of society (Goulet, 1978). It involves selective growth, distribution self-reliance, employment creation, and above all respects human dignity. It is at one and the same time a new development strategy and a new development ideology." [The emphasised factors are similar to some properties of endogenous development theory which is discussed thoroughly in Chapter Four: The Model.]

Stöhr et al. (1981) refer to Lee's (1981, p. 107) overall summation of a 'world scale' for developing nations between 1950 and 1975 which indicates that despite growth rates averaging 3.4 per cent poverty and underdevelopment still remain. Lee estimates that, whereas 33 per cent of people may have increased their welfare, this is more than balanced by 40 per cent for whom life has indubitably become worse. He then writes: "The empirical record of almost three development decades reveals more underdevelopment than development, regardless of what indicators are used for measurement. Existing strategies to bring about a broader participation in development have failed." Although the explanations for this lack of success vary a great deal in different context, but Stöhr et al. (1981) classify them:

- a) those who focus on the inappropriateness of the model of development used; (which has often been urban and industrial in nature and has used growth as a proxy for development both in ideological and strategic terms.) and
- b) those who argue that the problem is essentially a structural one. [Blaikie (1981), for example, argues that Nepal is a dependent periphery of both India and the world, and that the underdevelopment of Nepal will continue unless these basic structural relationships are changed. The underdevelopment of Nepal is not in his view a consequence of isolation but of incorporation.]

The explicit aim of development in different cases indicates general strategies showing the relation between national and local interests. For instance, Stöhr et al. (1981, p. 453) refer to some of them in their conclusion and say: "The reduction of disparity in India, local self-reliance in resource mobilization in China and integrated nations out of disparate ethnic groups in Africa are characterized by participatory centralization and that local control functioned within clearly defined central limits."

Wu et al. (1981, p.155) argue that development from below can function effectively only within a clearly defined national framework in which the peasants have seized power. They identify six key elements which help explain China's success during the last three decades having both 'planning from above' and 'planning from below' simultaneously which involves both agriculture and industrial policies. They have summarized the essential feature of the Chinese approach to 'planning from below' for rural development:

1. the strategies focused on the provision of basic needs to ensure that the population has productive work; (this is supplied with essential commodities, medical and health care, local communities controlled education and reassignment of those who have been away to where they have been originate.)
2. a well-defined national framework for local control of decisions regarding use of resources, planning for production, infrastructure improvements, work values, work distribution, and the deployment of surpluses; (consequently, there is a direct local control by the collective and flexible ownership of the means of the production to qualify their work.)
3. the set of national policies for supporting the rural sector through reduction of agriculture tax, guarantee of low taxation, price support ensuring favourable terms of trade for the agricultural sector, as well as provisions for purchase price bonuses for production above planned quotas;
4. the promotion of small-scale industries which are complementary to the rural sector;

(they may be engaged in the production of inputs, such as nitrogenous fertilizers, for improvement of agricultural production, in the repair of agricultural machinery, or in processing of agricultural products.)

5. local control of surpluses generated by agriculture and small-scale industries under the management of the brigades and communes; (surpluses from the industrial enterprises are generally ploughed back for reinvestment.) and
6. the emphasis on the use of local resources, manpower, and knowledge. (Financial aid and tax reliefs are available to the poor regions or for the needy cases. The accent is on self-reliance and on making the best of available local resources.)

Regarding the item No. 5, the same source quotes from Griffin et al. (1979) and signifies that one of the major causes of continuing rural underdevelopment in many Developing Countries is not the lack of productivity nor the lack of generated surpluses but the lack of local control over the surpluses. Citing from Stöhr et al. (1977); Lo et al. (1978) about the promotion of regional development, Wu et al. (1981, p. 177) claim that regional control over the penetration of its economy by outside (national and international) elements is a key element as well as control over economic surpluses generated within the region. They indicate:

"In China, regional self-reliance under collective ownership and decision making allowed for regional variations in style of management, in selecting programmes which are suitable to regional level of development and available resources. ... **Self-reliant development did not mean the closing-off of options but the creation of opportunities, such as agriculture-oriented small-scale industries, which are suitable to the local context.**" [This is also one of the thesis emphases.]

The same source follows and claims that the success of self-reliant rural development in China was possible only with the implementation of carefully designed national support systems, including favourable pricing of agricultural commodities, tax reductions, favourable terms of trade, as well as a unified purchasing and distribution system.

However, decentralisation and increased popular participation, especially of rural peoples, in the development process are the popular suggestions being made explicitly in many sources⁸. There are two kinds of opinion in India which relates to Gandhi and Nehru. Gandhi in many ways epitomized many aspects of the ideology of development from below, whereas Nehru was closer to development from above in his ideas (Ibid.). Misra et al. (1981) call for a return to Gandhian philosophy and its application as an 'ideology' as well as a technique. Many believe, as Stöhr et al. (1981) do, that development from below has the ideological underpinning to give spatial planning in Developing Nations a new direction, and possibly to bring new hope in the struggle against poverty. But, they do not neglect the mechanisms for practical implementation at larger scale which still have to be developed and tested under conditions of interacting national and international political systems. This point is also the thesis's concern that will be addressed later using the second paradigm of the model of endogenous development, i.e. supply-demand relationship.

1.B.7.1. Indigenous Development

Examining the theories mentioned above within the context of Iran, Wiarda (1983) reviews some of the 'indigenous development models' arising from the Third World. He puts forward the Iranian Revolution, as one instance of a general movement in the Third World towards finding their 'indigenous' model of development. He initially states in page 433 of his paper that "A revolution of far-reaching breadth and meaning is presently sweeping only partially and we in the West are only partially and incompletely aware of it.

Criticism of Western development theories is not restricted to Third World intellectuals. On other grounds they have been criticised by several Western Scholars as well (see for example, Ackoff, 1974; Seers, 1979; Schumacher, 1973; Redclift, 1987; Sorensen, 1987). Furthermore, signifying the problems facing the implementation of the indigenous development, Wiarda (1983, pp. 444-446) raises six points which can be summarised as:

1. "... the search for indigenous models of development may prove to be more romantic

⁸ See, For example, Stöhr et al. (1981) about Thailand, Papua New Guinea, India, Nigeria, Tanzania, Brazil, and Chile.

- and nostalgic than realistic;
2. the challenge for an indigenous development model may require defending an exiting political system, justifying exiting castes, classes, etc.;
 3. the overall results of indigenous development models have not in practise proved to be successful;
 4. the present international economic and political situation, which make the 'isolation' of a country an impossibility, thus, outside forces have influence in forming and distorting indigenous development models;
 5. there is not a general agreement among the intellectuals and politicians of the countries concerned, that the indigenous models are the correct answer; and
 6. finally, variation of people's race and religion make achieving a consensus development model, either indigenous or imported difficult, if not impossible."

To illustrate the difficulties associated with indigenous model of development in Iran, especially following the War, Zargar (1989a) said that for a country composed of several ethnic groups with varied geographical environment, cultural background, in the present of economic and political forces of West and East, it is not easy to design a new model into which society can be moulded. He then referred to Al-Buraey (1985) and said that yet, little theoretical study is available which throws light on development. The author would like to argue that this is not the case for the model of endogenous development theory, discussed in this thesis (see Chapter Four: The Model). Rather, he suggests that there exists many positive points in both strategies one of which is the value of people's participation. The study of people's participation in Chapter Two indicates that the higher the degree of direct involvement of people in development programmes and their indigenous institutions, the better will be the result of their work.

1.B.7.1.1. Towards an Endogenous Development Theory

In attempting to understand endogenous development, which is assumed to be based on lateral relationships, via the other types of development strategy, e.g. those which are based on core-periphery relationships, the author refers to the Garofoli's (1992) idea which is expressed in his book and is about the revived significance of the region. This change of understanding has

enforce reinterpretations of the spatial articulation of production. In this regard, Nylon (1992) suggests that both 'core-periphery dualism' and the 'filter-down' concepts consider space to be a passive element in the development process, with the crucial factors of change being exogenous to the local socio-economic system. But, the shift from Fordism⁹ to the flexible specialization of production places emphasis precisely upon the role of local social forces in creating opportunities for autonomous development. In Garofoli's new paradigm, space - the region - with its specific characteristics becomes the strategic factor of development. The region is the place where non-transferable social relations, cultures, historical experiences, institutions and business and market relationships cluster, creating an environment which will determine whether indigenous potential can be mobilized. This brief can be fitted in the general framework of endogenous development.

A model of endogenous development, similar to the above descriptions about indigenous development, will embrace such elements as: local entrepreneurship and capacity to innovate; the expansion of local firms; the use of local physical and human resources; productive inter-dependencies among local firms; the maintenance of local enterprises under local control; and the vital role of local development policies and local forms of solidarity and social regulation. These are considered by the thesis to be appropriate environments for operating such model. Rather, the endogenous development model is not limited by the scale or types of the projects and can be located in international, national and local situations to satisfy people's ideological, juridical, political, cultural and theoretical needs. This will be examined in Chapter Four.

It has been also confirmed by the literature that the most important factor for revitalizing and redesigning our societies and their economies is a change of paradigm, a new perspective, a different way of viewing the world. For these purposes, the author suggests the endogenous development model. **The endogenous development is suggested to be a progress through which a concern is given to innate knowledge, and internal potential powers of people and their transactions play an essential role in development plans. It also stimulates the**

⁹ You can find more about Fordism and Tylorism and their role in forming industrialization in Chapter Two: Section 2.A which is about Design Process.

individuals and societies with multilateral plans for development from within. Using external resources can be justified only when they cause the growth of society's potential.

People's participation and their capabilities of identifying the problems and solving them, even in harsh situations such as economic crises, natural disasters, wars, etc., will help understanding the necessity and practicability of the endogenous development model. Section (e) in Appendix One, therefore, has been designed to help investigating the current problems facing our societies in the process of hasty development programmes which is resulted from misunderstanding the knowledge required to accommodate natural responses of the people, finding their causative factors and the ways of solving them.

Conclusion of Development

Before turning to what ought to and can be done to dissolve the development problems, it was necessary to reexamine the problems of development and reformulate them in light of the discussion up to this point. The understanding of development as 'growing from within' reflects and incorporates elements of past development definitions and measures in several ways. These differences, in turn, suggest new approaches to the design and implementation of development projects and programmes, whether undertake them as a part of national development strategies by the governments (of Underdeveloped and Developing Countries) or as a part of the aid programmes of international agencies.

It is apparent that the sequences of the observations and proposals reviewed in this section move progressively from simplicity to complexity. These proposals differ not only in content and complexity, but in kind. They are based on different implicit concepts of ways to treat a development problem. It is worthwhile mentioning that they are mostly related to:

- a) aims of development;
- b) ways of development;
- c) outcomes of development;
- d) direction of development strategies; (from past to future, from subject to object, etc.)
- e) means for development;

- f) stimulants or motivators of development; (history, future plans, needs, wants, etc.)
- g) kinds of development; (rural, local, national, global, mental, etc.)
- h) stages in development programmes; (development of the means for development)
- i) priorities in development programmes; (growth and quantification, development and qualification, etc.)
- j) attitudes and/or behaviours to process subjects into objects and activate the potentiality; (possible into actual and from inside to outside)
- k) appropriate time for development; (i.e. after disasters, after wars, etc.) and
- l) development criteria. (Such as acceptability, sustainability, availability, homeostasis, homogeneity, stability, etc.)

In most proposals reviewed in this section, the growth of the economy is the principal objective for development. Therefore, they focus on the standard of living. Those who advocate a national industrial and centralized policy are primarily concerned with the average standard of living. In contrast, some reject growth and the economists' concept of standard of living, but they do not explicitly formulate their own objective. It is perhaps because they are more concerned with improving the quality of life than doing this for the standard of living. If this is correct, then their objectives are development rather than growth.

It was studied that the prevailing view of the world is changing and that awareness and understanding of this change open possibilities for redirecting our affaire more effectively than would otherwise be apparent to us. The author agrees with Henderson that growth should no longer be accepted by a society as an end in itself. He also suggests that basing Henderson's belief on a biological analogy can be misleading. Society and social groups are not organisms. Unlike organisms, their parts have purposes of their own¹⁰. In this respect, **growth is not seen by the thesis as either necessarily evil or necessarily limited. It is a means not an end and is therefore an option that should be evaluated concerning explicitly formulated social objectives. Development is taken to be the end that purposeful individuals and groups should seek. Development is not a biological analogy but a psychological and social concept.** It is with respect to their potential contribution to

¹⁰ See the discussion about purposeful systems in Section (3.B) of Chapter three.

development that proposals for revitalizing societies and their economies should be evaluated.

Therefore, a definition of development is only possible when based on particular philosophical and ideological principles. On the other hand, the real implementors of development are the people themselves, who either see their own needs and problems or are made aware of them. Development should proceed at the people's own pace and standards; and the techniques of development should be simple - that is ones that the people can afford, understand and benefit from.

For these reasons, it has been argued that the only way the Third World Countries can rescue themselves from poverty is by radical changes of structure and by means of institutions that have a popular base and support. They might also reflect that 'poverty' as it is known today was almost unknown in pre-colonial in these countries. They indicate that the people as a whole in cities, towns and villages should be allowed to reenact their own life experience to its logical conclusion. This is vital. Political changes in Third World Countries will remain of little long-term value unless it is cultural change as well. But, cultural change becomes possible only when the people as a whole fight out their mental battles themselves. Others cannot do it for them. Development cannot be grafted on to a country like a foreign body. It must grow within the country at grass-roots level, that is within readily available resources.

Many development commentators in Developing and Underdeveloped Countries claim that there was no unemployment or underemployment or malnutrition before colonialism period. As far as nutrition is concerned, the people who suffered most from specific nutritional deficiencies were those brought most full into the colonial economy - the urban workers. Those who managed in spite of colonial rule to maintain their traditional pattern of nutrition are generally very healthy and resistant to disease. It is also understood that **poverty is not simply about shortage of resources. It is about exclusion and power, about relationships and loss of self-respect, it is about lack of choice and limitation of freedom. But, all these things are related to lack of resources**¹¹.

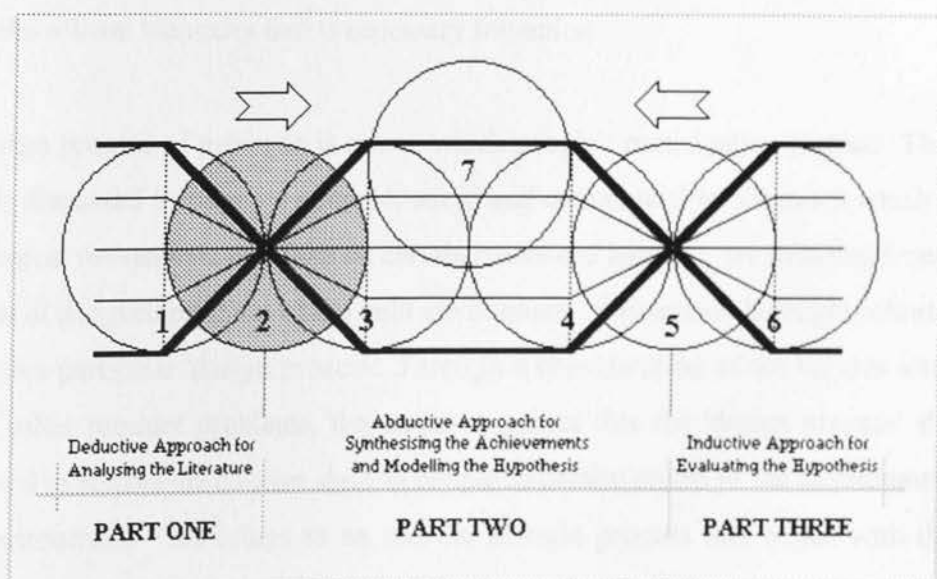
¹¹ These are some characteristics which help translation of the word 'Mostazafien'. This word has been used in The Holy Quran frequently and aims to illustrate poverty in relation to the social, mental and spiritual status rather than resources.

Therefore, it is vital to fit the natural responses of people in development programmes. There are also deep subconscious about the values, which they developed and spread as community to respond during the time of disasters and crisis etc., without trying to impose formal institutionalised organization in which all these native natural potentials will be inhabited because of the mechanism in physical situation involved. Although society should be a system made of components, in some societies there are subsystems according to the capability of their knowledge, but the whole systems are missed or do not work well because of the specification and fragmentation. **Structuring the whole system is the basic aim of development in these societies.**

Some arguments in the discourse of development referred to structure of society. They consensually suggest that government means to produce the interest of the whole nation of the whole society through structure, organization, behaviour and what so ever. But, the problem with the centralized organizations is that it imposes a global uniform perception of the different places of the country itself, rather than setting a policy which is the synthesis of diversity. Many indigenous societies do not resolve their problem through organization or the like. Their real organization is the organization of the values themselves. They use values to generate all their activities and behaviours and responses. The formal responses by government and other agencies should actually relate to these values which can be translated into new organisation and strategies capable of handling the problems of their implications.

The present study suggests that the recovery of the indigenous societies is possible by new proposals which can incorporate the points discussed so far. The model of endogenous development theory as a guideline and policy is suggested for this purpose. Of course, the application of this guide line to the needs of other cases during the development programmes, requires extra work to adapt them to their particular social, political and environmental circumstances and its feasibility and possibility must be examined. Therefore, the next chapter is a critical analogy of current discourse by reference to 'people's participation' (2.A), as a key point and somehow hard to be implemented in development programmes and 'design process' (2.B), which is future oriented and emphasizes mostly on productivity and the relationships between producers and users.

CRITICAL ANALYSIS OF CURRENT DISCOURSE



INTRODUCTION TO CHAPTER TWO

Chapter Two is divided into two sections: People's Participation and Design Process. Both are needed to express a critical analysis of the current discourse and to lead towards the model for endogenous development. This chapter differs from Chapter One in that its subject matter is less abstract and more predicated towards actual, everyday experiences. Its conclusion that combines and addresses all the concepts covered in the current discourse completes Part One.

The matter of people's participation is introduced with a recapitulation of its history. This opens up a range of questions - such as what is meant by 'people' and at what level they can be said to be 'participating' - that need to be analysed before the notion of people's participation can be taken as reliable. The term people's participation is often an end in itself, misappropriated to exonerate errors made by centralised bodies and in such situations, its use does not reflect the empowerment or autonomy of individuals within society. Between the extremes of allowing populations to choose between preselected alternatives and non-hierarchical ongoing dialogue, are many stages whereby people are allowed to relate to decision-making process. Both extremes compromise the health of society. The ideal procedure lies between and is one that permits communication among all individuals yet retains the official hierarchy that is necessary for action.

The design process of products is one in which people's participation matters. The role of design is discussed through its political, social and commercial implications which have led to ideological movements that take on certain issues and agendas. By focusing from general criticisms of designed products to the built environment, this section highlights shortcomings behind this particular 'design process'. Through a consideration of the various attempts to correct other product problems, the author suggests that the 'design process' should be customised to involve the creative ideas of people as particularised to the development of the built environment. This brings to an end the thought process that began with the broad philosophies explored in Chapter One, as now focused onto the specific and practical issues related to the design of the built environment.

2.A

PEOPLE'S PARTICIPATION

Introduction to People's Participation

2.A.1. Historical Background

2.A.2. Towards a Definition of People's Participation

2.A.2.1. Who are the People?

2.A.3. People's Participation and Politics

2.A.3.1. Advantages and Disadvantages of People's Participation

Observation on People's Participation

Introduction to People's Participation

The purpose of this introduction is to demonstrate the importance of people's participation in designing development programmes and to clarify the scope of the thesis's objectives. A participatory approach was adopted for an operational research in the regional planning of Mobarakeh-e Isfahan in 1983, whose necessity is still agreed upon by both the authorities and the experts. Initially, people's participation approach was pursued in Pahlavi's regime of Iran by some elites, as an intellectual act in the 1970s, being concerned about movements in the built environment professions in the West. In a broader sense, it was also conducted in the reconstruction of damaged areas after Iran-Iraq War (1978-1986), which also referred to by my colleague Zargar (1989a), whose work had significant role in opening up the discourse about people's participation in the present section.

People's participation is an indispensable ingredient of the development guidelines which intends to qualify the life. It is said to be an old theory, well explored in many contexts. In this section, the intention is to review those aspects of the participation theory which are about the built environment. First, some major theoretical issues about popular participation have been discussed, then, since the topic of the thesis is about endogenous development in built environment and its implementation in harsh situation, a brief review is made of community participation in the context of reconstruction in the provision of shelter. Finally, an attempt has been made to outline some specific aspects of community participation.

Community participation is discussed in most documents dealing with planning and development. In this regard, Oakley et al. (1985, p. 1) claim: "In fact, it is rare these days to find a document on development strategy or approaches which does not refer to participatory in nature". Styles (1971, p. 163) writes: "Participation has become a key word in the planner's vocabulary". Ekistics Editor (1972, p. 71) also claims: "In the past few years almost every planning report has had its participation component". Carapico (1985, p. 203) says: "Virtually all contemporary development strategies stress the importance of participation by working people in both policy formation and the benefits of economic growth."

There are studies on 'community participation on water and sanitation', 'low-income housing

projects', 'squatter settlements upgrading' and so on. The notion of 'community building' and 'community architecture' are also on the agenda of many architectural debates in Britain, all of which have the 'People's Participation' as their central theme. More generally, there are studies of 'community participation in development planning', in 'rural development' and 'social development'. From this long list of documents, it seems that people's participation both as a means and as an end seeks something to be achieved. These achievements could be: freedom in a political context; equal opportunities for access to the public services; strengthening the professional works; more control of the government; homogenizing societies; reducing the gap between poor and rich to be able to avoid more conflicts; preparing some reliable consumers; mobilizing people for growth plans and so on. Less attempts have been made to use this theme for reorganizing the societies for the purpose of being more productive and independent in a long term sustainable development plan. Therefore, the reason of pursuing the participatory theme, in this thesis, is to place it as an end in the development programmes, otherwise people are already participating in all aspects of their lives.

2.A.1. Historical Background

Although the notion of people's participation is among the recommendation of new development plans, it is in fact an old approach. Gittle (1980, p. 29) says: "The role of community organizations in America has been a primary subject of concern for all the social sciences since the 1960s." In relation to this, Claude et al. (1985, p. 5) claim:

"The notion of participation was brought into focus in the 1930s. The idea was that **the more involved people were in the challenges of production, the more productive they would be** But the term 'participation' continued to gain currency primarily in decision-making processes in Industrialised Societies. It is only since the late 1960s and the 1970s that the concept started to be used in the context of the newly developed subdiscipline of 'development administration'." [One of the author's emphases in defining people's participation.]

Martin writes in the preface to Lisk's (1988) book entitled, 'Popular Participation in Planning for Basic Needs', that one of the key features of development planning, since the mid-1970s,

is the notion of popular participation, both as an important condition for achieving sustained economic growth and social progress and as a fundamental goal of development in its own right. Moser (1983, p. 3) also argues that the reason why community participation was introduced was the failure of the 'growth theory' of development. She writes;

"It is a common place that the growth strategies undertaken by many governments in Third World Countries have frequently failed to secure a significant amelioration of mass poverty or a radical redistribution of income. It is this criticism which has led to an alternative view that the involvement of the community in the project can compensate for these deficiencies. Over the past decade, community participation has been incorporated in a variety of development programmes and projects in order to make collective involvement effective."

Zargar (1989a) refers to a property of indigenous people in solving their problems and says that, since time began, cooperation and communal actions have been the dominant approach to problem solving in all rural communities of the developing world. He cites several examples from villages in Iran and claims that, for example, cleaning the canals or 'Ghanats' is a communal task. No individual can do it alone. Also the distribution of water, where it is scarce, such as in central Iran, requires well-coordinated measures not only in each village but even between villages dependent on the same source of water. In this regard, it is worthwhile to refer to the United Nations report (1975, p. 32) as it reads:

"Historically, most societies have a tradition of popular participation at the local level. ... **The existence of these traditional forms of popular participation indicates the willingness and ability of the masses of the people to work together for the collective benefit and that many of their needs were served in this way.** These local traditions have often been among the first casualties of modernisation." [This is the author's emphasis which will be explored in Chapter Four implicitly.]

The traditional methods worked successfully through the ages, and still are working in indigenous societies. But, the new methods do not always give the desired results. Mandl

(1982, p. 9) also confirms that high hopes have been vested in community participation. However, some unforeseen problems and distortions have come to the fore. Setting up community participation has been more difficult than anticipated. Therefore, there is a need to recognise the difference between a grass-roots community action and a community participation imposed from outside.

2.A.2. Towards a Definition of People's Participation

A variety of definitions in the literature about people's participation suggest that it is generally a good thing. Wolfe (1982, p. 86) writes: "From the stand point of many development analysis and planners, 'politics' is bad, 'participation' good." Moser (1983) refers to the same property of people's participation and claims: "Participation currently considered a 'good-thing'." Arnstein (1971, p. 176) writes: "The idea of citizen participation is a little like eating spinach; no one is against it in principle because it is good for you." Zargar (1989a, p. 307) sheds light on its causes and claims that this positive attribute of participation might stem from values such as democracy and liberation which are the basis of Western thinking. In his words, the reason is that: "speaking up for the people implies an intellectual or even radical position as opposed to speaking in favour of bureaucratic systems which exist to support authoritarian governments with their centralized power." Although he agrees that participation is good, but he pinpoints its ineffectiveness and usefulness in practice. In this regard, he refers to an example of the ever-rising problem of homelessness in Developing World, despite years of propaganda for and practice of popular participation in solving the problems of shelter.

The lack of clear consensus about the diversity of definitions reflects the ideological range of development and the different approaches to planning (Moser, 1983, Whyte, 1983, and Lisk, 1988). White (1981, p. 6) with reference to definition of community participation agrees with the diversity in the objectives and looks for a working definition which he borrowed from the World Bank and says: "... **participation has three dimensions: involvement of all those affected in decision-making about what should be done and how; mass contribution to the development efforts, i.e. to the implementation of the decisions; and sharing in the benefits of the programmes** (World Bank, 1987)." He adds "**involvement in the evaluation and modification of the programmes**" to the definition cited above which is also the thesis's

emphasis and will be strengthened by feedback control, that of system approach, and abductive and inductive inferences, that of logic, in the model of endogenous development (see Chapter Four and Chapter Seven). Lisk (1988) defines popular participation in development as active involvement of people in the making and implementation of decisions at all levels and forms of political and socio-economic activities.

Oakley et al. (1985) conceive participation as an end and an exorable consequence of the process of empowering and liberation and Wolfe (1982) argues that conception of it can be positive or negative and can be considered equivalent to political democracy. He then describes democracy as a system through which people decide what development objectives and policies they want and what political representatives shall try to convert the objectives and policies into reality. He continues his argument about the conception of participatory approach as equivalent to involvement in the processes of societal change and growth that the term 'development' suggests.

People's participation is opposed to centralised decision making and the aim of popular participation is to reduce the role of people as passive executant. Bugnicourt (1982, p. 58) suggests the reduction of 'passive executants' role of people as an aim for popular participation, which may be perceived as people's involvement in implementation of the development programmes, and argues that it is opposed to centralised decision making. He also emphasises the role of people sharing in decision making and their meaningful presence at all stages of discussion, decision making, training, executing, management, control, education and etc. In regard to the present definition, Oakley et al. (1985, p. 19) review their impression of active participation in development when it involves people in decision-making process and state:

"Participation is considered to be an active process, meaning that the person or group in question takes initiatives and asserts his/her or its autonomy to do so ... the organised efforts to increase control over resources and regulative institutions in given social situations, on the part of groups and movements of those hitherto excluded from such control."

Arnstein (1971, p. 177) suggests eight levels of participation divided into: the first two as 'nonparticipation'; the next three as 'degrees of tokenism'; and the other three as 'degrees of citizen power'. These levels, which are sorted from the bottom of the ladder, are:

1. **manipulation**; (by which she means the occasions when people are guided and used as tools by power holders.)
2. **therapy**; (which can be seen as prescribing for remedies, for example involving the citizens to clinical group-therapy in planning by experts.)
3. **informing**; (which means that people are called and gathered to be told about their rights and responsibilities.)
4. **consultation**; (which is about inviting people to have their views about a matter.)
5. **placation**; (by which she means those situations where the citizens have actual and legitimate presence in a decision-making process, but the final decisions must be taken by others like local authorities not the citizens.)
6. **partnership**; (which is redistribution of power through negotiations between citizens and power holders through such structures as joint policy boards, planning committees and mechanisms for resolving impasses.)
7. **delegated power**; (which means the negotiations between citizens and public officials can also result in citizens achieving dominant decision-making authority over a particular plan or programme.) and
8. **citizen control**. (That means the highest degree of participation and control on a matter. In this case citizen are able to negotiate conditions under which outsiders may change them.)

The main argument of this thesis is also about control which considers people's participation not only in decision-making but also afterwards. This will create a kind of continues cyclic process of knowing and doing and vice versa. The result of so doing would be evolution of society's thought and generation of scientific theories, also progression of products. Zargar (1989a, p. 309) referred to a problem of citizen decision

making and said: ".... One of the theoretical obstacles to the participation of the masses, is that in practice direct involvement in all tasks becomes impossible and an indirect participation through the representatives must be used. In this case, again a few people will decide on behalf of the others, as the authorities do." Despite the difficulties associated with the implication of people's participation objectives, the author argues that some consider it as positive factor in solving different problems. They refer to the missing values and the sorts of knowledge which can be perceived holistically. They do not seek a specification to reduce the problems into special and small parts by using technology and science. They believe, this will help solving the problems associated with fragmentation of attitudes and behaviours which lead to the emergence of centralized organizations. Their attempt is to bridge the gaps by suggesting interdisciplinary approaches; popular participation and the like to insure their future and resolve their problems. To them, people's participation is an end which should lead to lateral organizations.

Despite the underlying assumption which suggests that governments may have different goals to those of the citizens, Zargar (1989a) said that this was not necessarily always true and assumed situation where the people trust their government and believe in its decision. This is conceivable, but the thesis's argument is that **the concerns in most of the debates about people's participation are to conduct those definitions which lead to some revolutionary changes of the existing organizations to create or support lateral communications with no top or bottom.** However, there still exists another obstacle of the theme in practice and it is the possibility of having factions among citizens on every matter.

The United Nations (1975, p. 5) points to the importance of popular participation in decision-making as the heart of the participatory approach and classifies it in a more comprehensive way into four stages:

1. defining the situation requiring a decision;
2. choosing the preferred alternative;
3. determining how best to implement the decision once it is made; and
4. evaluating the consequences of the action taken.

As far as the literature is concerned, the theory of people's participation is an old idea and its concepts have been defined in several ways and different degrees. The heart of the notion is identified to be the power of people to have control over their affairs through the decision-making process¹, which is either for solving the problems or designing development programmes. In productive and indigenous societies, these processes are mostly about making decision for having the right objectives, the applicable schemes, the appropriate means and the useful products which are evaluated by feedback mechanism.

2.A.2.1. Who are the People?

If different opinions about participation are held, there are hardly more clarity about the meaning of community. 'People' and 'community' both imply totality: everyone or all the members. In discussing the community participation concept, another meaning is anticipated. Lohman et al. (1986, pp. 25-26) try to distinguish it by suggesting three points: "first, a community is not a uniform mass of people, but a heterogeneous collection of individuals and groups among whom multiple social ties have developed. Secondly, the distinctive community groups have different, often opposing, interests The third point is that as individual and groups have different interests in neighbourhood improvements, they do not have equal opportunity to participate in decision making." They also mentioned that an improvement programme is not a neutral intervention.

Criticizing the statement cited by Hollnsteiner (1982, p. 39), who says that in general agreement "the poor majority have little access to resources and power; instead local elites have strong to say in decision making", it is conceivable to suggest that his definition lacks some points and needs more modifications. Because, elites' role in the society is different by their roles in the certain projects. Society needs professionals for solving its problems and designing its future, but this should happen with respect to the existing values and knowledge. Therefore, it is necessary to remember that for realizing the problems there is a need for world

¹ 'Decision-making' is a process that converts information into instructions. Instructions are messages that are intended to affect the behaviour of the system in order to improve its performance. Decision-making requires thought and thought requires mental manipulation of a representation, a concept, of that which is to be decided about. Through manipulation of such representations a decision maker can determine what alternatives are available and what the consequences of each are likely to be.

views, intuitions and knowledge which are embodied in the society's culture and history and are about life as a whole entity. Furthermore, by propounding the theme of participation, **the aim is to be able to use the cultural resources, values, symbolic principles and people's innate knowledge to help societies' idealization², thus transformation.** Then, in next step, there is a need for using science and technology, which can be explored in the instrumental principles, to solve the existing development problems by the experts and their participation.

Many commentators agree that there are different approaches in propounding people's participation. Accordingly, it is not limited in a specific area (e.g. politics) with a certain objective (e.g. decentralization of power). If participation is a Western product, one might ask whether democracy and liberation ever exist in traditional societies, in the Developing or Underdeveloped Countries, or not. In these countries, because of the transactional social ties of the indigenous communities, people usually have equal opportunity and high accessibility to all aspects of their lives. Even in the hierarchical organization of tribal societies, people are consciously aware of the events and their social activities and are participating in idealization, therefore structuration of their societies's structure³. They have dominant role in decision-making process, directly and indirectly, by their consensus on the contents, either before making decision (by suggesting), or while the decision is in the process (by controlling), or after making the decision (by either rejecting or accepting).

Giddens (1984), the British sociologist, stresses that structure of society is the unintentional consequence of action. He believes that society is not a pre-given objective reality but is created by the action of individuals. Individuals are not free to choose how to create society but are limited by specifications of their original position which they do not choose. He believes structures are built through action and action is constituted structurally. He identifies 'meanings', 'norms' and 'power' as the three aspects of any human action. **In structuration theory 'structure' is considered as rules and recursively implicated in social production;** institutionalised features of social systems have structural properties in the sense that

² See Boulding's (1956) classification in Chapter Three: 3.A and also Ackoff's et al. (1972) book: On Purposeful Systems.

³ See Chapter Four: Sections 4.A and 4.B for specific description of the words structure and structuration.

relationships are stabilised across time and space (Ghomashchi, 1998).

People are not passive actors who are controlled and programmed by certain rules and principles, rather they are active and able to change dominant rules while they are affected by such existing principles. The individual is an actor. S/he can start a new role in society intentionally, but this new role would probably be influenced by others' roles as social system. This is a continuous interaction between individual and the society (Healey, 1997). Giddens (1984) also looks at people as agency, active rather than passive, and choice makers rather than fatal. For him, people as individuals, live in webs of relations through which structuring forces bear on them. They, as active agents and in the social situations of the relations within which they live, build their own sense of identity. Therefore, participatory approach can facilitate obtaining evolution of cultural and moral values as well as economic and environmental regeneration and progress.

2.A.3. People's Participation and Politics

Reviewing the literature confirms that one aspect of people's participation is 'sharing of power'. In this respect, Whyte (1983) indicates that community participation is one of the most political issues of the 80th approach because it evolves directly national government to control its people. Oakley et al. (1985) in relation to the definition of participation as a process of 'empowering' claim that participation is concerned with the distribution of power in society and that power is the central theme of participation. Hollnsteiner (1982) also refers to leaders' interest in promoting 'progress for all' and says that between the two extremes of apathy and violent confrontation lies a broad range of legitimate and effective participatory behaviours that can lead to people's development and 'genuine structural change'.

2.A.3.1. Advantages and Disadvantages of People's Participation

There are advantages for community participation some of which are listed by White (1981, p. 11) in ten items⁴ which are cited briefly as following:

⁴ He explores them in detail in pp. 12-24 of the same source.

1. with participation, more will be accomplished;
2. with participation, services can be provided more cheaply;
3. participation has an instinctive value for participants;
4. participation is a catalyst for further development;
5. participation encourages a sense of responsibility;
6. participation guarantees that a felt need is involved;
7. participation ensures things are done the right way;
8. participation uses valuable indigenous knowledge;
9. participation frees people from dependence on others' skills; and
10. participation makes people more conscious of the causes of their poverty and what they can do about it.

Bugnicourt (1982, p. 74) expresses his opinion about the notion of imposition of participation in the context of Africa and claims it is confused by the incursion from the East, the Mediterranean, or across the Atlantic. This participationism, he says, which is often influenced by Christian or Maoism thought, undoubtedly mobilises much goodwill; but it is not exactly suited to the African situation, and leads to distorted interpretations.

Zargar (1989a) referred to decentralization of decision-making and distribution of power as major components of people's participation and claimed that in practice development programmes require the assessment of matter on a regional or national level. He said that a higher rate of people's involvement is possible in small communities and on a local scale. Beyond that indirect participation, through representatives will only be possible which are presumably elected by voting, therefore, the decision will be made by 'few' speaking for the masses. The thesis's impression about people's participation is quite different from Zargar or Bugnicourt's, therefore it suggests that their claims need rethinking. That is because there is evidence suggesting people's direct involvement in international and national levels of decision-making in economic, political, cultural and social dimensions, e.g. Islamic Revolution of Iran (1978) or recent election of presidency⁵ which resulted in an enormous and

⁵ In this election more than 1/3 of the Iranian population voted (twenty million votes) for Dr. M. Khatemi and he was elected as president of Iran in 1997.

unforeseeable outcome. Furthermore, it should be kept in mind that indigenous societies have mechanisms to evaluate things or select their leaders which are said to be more complex and abstract than that of modern societies (see for example Purce, 1974).

Another obstacle is the popular participation's requirement for knowledge. In daily life people frequently rely on the knowledge of others, i.e. the so-called professionals. Because of this, some commentators claim that participation by its nature opposes professionalism. To some extent it sounds true. But, the author would like to claim that if there is a consensus upon the fact that society needs different activities and jobs and people all are, somehow, experts in their own work, then there is a need for new interpretation. In addition, knowledge and science have different meaning: the former is usually used for inducing a whole and the later for deducing the parts. Participation, thus occurs in different levels and scales and covers both areas which should be identified carefully. This has been discussed in Chapter Four.

The editor of *Ekistics* 1972 (No. 201, p. 72) in relation to democratization and liberation as another obstacle of participation wrote: "... the issue of the democratization of local decision-making has become a jaunting court for all speeches, policy discussion and political campaigns. Some of this rhetoric can be taken seriously, but most of it proves only to be a manipulating or quietening tactic." The author would like to suggest that there is a need for remembering the objective of people's participation which seeks unity through diversity. Finding a solution for the dilemma of social life through reconciling diversity and consensus, individual preference and public interests, Ghomashchi (1998) cites from Healey (1997, pp. 56-57) who claims that the social world is not constituted of autonomous individuals, each employing their own preferences in order to obtain material satisfaction. Instead, it is built on individual identities, as social constructed. She emphasises that attitudes and values are formed through social relations with others. She writes:

"The powerful forces which construct our lives are actively made by us as we acknowledge them in our doing, seeing and knowing, in our system of meaning, ... we maintain, modify and transform the structuring forces which shape our lives, We are shaped by our social situation but we actively shape it too."

One of the most important problems with participatory approach, after its shortcoming for creating the fundamental change required for the development of a community, was mentioned in the literature to be its role in transforming the 'burden' of the problem from the authorities to the weak shoulders of the poor. Bugnicourt (1982, p. 73) claims: "The peasants and poor town dwellers have only to 'participate', that is to say, make themselves the effort needed to secure what the privileged part of the population enjoys free of charge, thanks to public financing." The same source also referred to the contradiction between participation and bureaucracy. In Wolfe's (1982, p. 102) word: "... tension between bureaucracy and participation seems to be unavoidable and it is unrealistic to expect the tension to be resolved in favour of one idea or the other."

All these criticisms, which refer to theoretical aspects and those of operational obstacles of popular participation, point to the fact that this concept should be seen as a revolutionary idea rather than the reformist one. Therefore, the aim of participation is to redirect the ways in which the attempts tends to fragmentation and specification, thus, segregation of the societies and their actors⁶. Participatory programmes need some organizations. These organizations might be either adapting one of the existing local institution or establishing a new one with a special characteristic.

Although the participation literature unanimously agrees with increasing people's role in development programmes, this approach involves theoretical and operational constraints. Many commentators believe that people's participation on a local scale can work more effectively than on large scales. The thesis's concern is that this idea is more likely to be based on growth and its implementation in short run programmes rather than development. **Moreover, effective participation needs appropriate structure and organization to be applicable in different scales.** This organization, either the extension of traditional systems

⁶ Bugnicourt (1982, pp. 71-72) also argues about the administrative systems in operational participatory approach which are a prolongation of the anti-participatory attitudes. He, then refers to these systems, which contribute to the formation of a real allergy to participation, and counts them as: the hierarchical spirit; bureaucratic tendencies; preference for written; the desire for standardisation; and insufficient personal commitment on the part of public servant.

or a new established one, has hierarchical structure (vertical or lateral) which should be studied to be able to assist development activities. Therefore, a citation about participative democracy, which seems to be similar to the concept of local authorities and what is told Western democracy, is conducted in Section (f) of Appendix One to obtain this goal.

Observation on People's Participation

It is perhaps one of the obstacles of people's participation concept that public officials are not likely to adopt any of the proposals mentioned for governments because there is a belief that they would reduce the size, power, and number of government agencies. Many of the officials' jobs would be jeopardized. **Therefore, the thesis suggests that these proposals are not likely to be adopted without a great deal of public pressure. Such pressure should be directed at demonopolizing and debureaucratizing government itself. Participatory approach requires fundamental changes in the structure and functions of government, i.e. returning government to the people, converting it to a participative organ.**

The study has adopted a view of small, self-governing units as a result of analysing the proposals which suggested that in popular participation in transitional process of reaching the ultimate integration between government and people, e.g. participatory democracy, these units should be the source of the authority and responsibility assigned to other units of government, and they should determine the use and allocation of resources. The basic units can do whatever they want as long as they do not prevent other units from doing what they want. Actions that adversely affect another unit require that unit's approval. Disagreements that cannot be resolved are settled by the most local unit of government responsible to all the affected units. This principle applies to all types of units. Sectoral activities can be provided or procured by basic units or, with approval of these units, by more removed units. Even when provided by more removed units, these services would be monitored by the basic units affected⁷. Accordingly, the local programmes (such as education, health, police, transport, etc.) can be transformed into the regional plans (such as economic affairs, interior affairs, etc.)

⁷ Similar to this organization, named Canon-e Twosē (Development Unit), was employed in regional planning of Mobarakeh Isfahan (1983). Some of its models are described in Chapter Four, Modelling (4.A) and there is also a brief review of that research in Chapter Five: Supporting Practical Schemes.

and the regional plans can be transformed into the national strategies (such as constitution, defence, foreign affairs, etc.) and the like which will be examined in relation to the concept of endogenous model as a basis for its organization.

There is no consensus among all professionals about the implementation of the participatory methods, but they agree that these would confront several obstacles in practice. For instance, Zargar's (1989a) argument about the role of the state in pursuing such approaches in reconstruction after War which shows that while community participation implies grass-roots, local, bottom-up action, in practice the coordination of these initiatives by a state based organization became necessary. He also claimed that there was a 'contradiction in terms' when the instigation and possible control of grass-root initiatives came from the state. Contrary to his claim, the literature about reconstruction almost unanimously recommends increasingly the survivors' role in all phases of disaster, from pre-disaster planning to relief and reconstruction. For example, one most promising approach to reconstruction, training and educating, involves a certain level of survivors' participation.

Conclusively, the thesis signifies that people's participation, as an end, is a revolutionary concept. It should seek the missing elements in development practices in different context. **A holistic approach, employing feedback control accomplished by inductive and abductive inferences, is one of these attempts towards defining the process of life.** People usually help to place each development project and programme to an appropriate holistic model by their intuition, wisdom and world views. Therefore, they are and should be aware of all the decisions and events in their environment, because they are either its producers or users. They also invent and control the appreciate devices for promoting the cultural values and their roles in sustaining and transforming the society.

People are neither against professionals, nor their participation is. Their contributions rather help distinguishing or emphasising the genotypic projects (using abductive⁸ inference), similar to what they do for 'symbolic principles' in an abstract level (using inductive inference). They also contribute to the phenotypic projects either by being

⁸ Deductive, abductive and inductive inferences will be discussed in Chapter Four, Section 4.B.

consulted in design process (using deductive inference), or by their labour or by their consumptions. If the interdisciplinary approach, that of Systems Age, is considered to be a scientific revolutionary achievement, versus fragmentation and specification, participation may help finding the ways for bridging the gaps between different activities in different fields as well (see the section about people's participation in design process in this chapter, i.e. 2.B).

People can participate either in development programmes (evolution of thought and values) or in growth plans (generation of typologies). People's participation, as an end, should seek for change in society maintaining cultural transformation of values to sustain its identity. If professionals use it as a means, for the sake of end projects, it may also have negative results.

The critical analysis of people's participation assumed, regardless of any specific context, to be one significant issue in development discourse. It seems that this theme has been also used for different purposes, usually by interference of the outsiders. The thesis concern about people's participation is to strengthen the existence of indigenous organization in the society by respecting its values which are the stimulus of its cultural transformation. In this respect, outsiders to a region such as governments, institutions and agencies should participate with people and should have cooperative attitude and multidisciplinary approach in the ways they go for satisfaction of the society's needs.

Considering the goal of people's participation which involves people in their own affairs and encourage them to participate in decision-making process, the initiators should overlook this idea that the responsibility of decision-making is still theirs, by emphasising a 'top-down' strategy. In page 199 of *Ekistics* 251 (1976), there is a citation from Professor Otto Koenigsberger, who said in a workshop at the UN Habitat Conference in Vancouver, that he did not particularly care for the expression 'people's participation', but thought it should be the other way around: the people sometimes condescendingly allow the planner to help. So, it is conceivable to consider how to conduct effective participation, without waiting for the structural changes. The following section in this chapter is an attempt to find a way for effective participation of both parties (producers and users) in design process.

2.B

DESIGN PROCESS

Introduction to Design Process

2.B.1. The Role and Status of Design in Society

2.B.1.1. The Designers

2.B.2. Design for the Real World

- 2.B.2.1. Third World Problems and Priorities
- 2.B.2.2. Designing with Indigenous Knowledge
- 2.B.2.3. Symptoms or Causes

2.B.3. Creative Thinking

2.B.4. Users' Participation in Design Process

2.B.5. The Procedure and the Process of Design

2.B.5.1. Different Stages of Design Process

Summary and Further Discussion

Introduction to Design Process

The motivation of this section arose from a dissatisfaction with the existing literature about design, in general and in different fields, the vast majority of which deals only with the surface of the subject. It is all too rare for a design book to look directly at values and how they might relate to a value system, and to look at either human or ecological implications of those values. This section, therefore, starts with a brief introduction to the general definition of design in different fields. Then, an attempt has been employed to explore some disadvantages of design for market and benefit which is dominant in most of the countries with different status and affluence. Through different criticisms of the environment created by 'market-led design', Green Thinking and Green Design are matters of concern in the following text whose points have been defined by those ideas which ask about the objectives of design, seeking the socially useful products. As a solution, decentralization of the production process pinpoints the necessity of the multi-disciplinary approach and the cooperation of different disciplines.

Contributing to the field, the author has shifted the discussion from general concepts to specific notions in the section named Creative Thinking and has focused on the attitude in architecture and urban design which, in turn, confirms the importance of creativity and mental process. The conclusion of the discourse about design process considers users's participation, as a fundamental theme for qualifying the development programmes or reaching to the objectives of the endogenous development. To illustrate the feasibility of people's participation, the last topic of this section, the Procedure and the Process of Design, has been conducted in order to find an appropriate model by which people's creativity in development programmes, collectively or individually, has been examined in bringing new images or in solving the problems of the built environment.

To reiterate, it is important to mention that the following discussion clarifies different meanings of design in different disciplines. It is also pursuing the role of design in changing the society. To be able to gain this objective the following discourses has been conducted to investigate the mechanism of development plans and programmes analytically, by focusing on the design process. This is assumed to help propounding a guideline for the future plans which is considered to be based upon the past and responsible for transformation and, therefore,

evolution of the society's thought and values - similar to a natural or traditional production.

Therefore as a starting point, the author would like to introduce some definitions about design which refer to those who believe in a system view. They claim that a design consist of a 'system' of decisions. This means that it has properties that none of its parts do, and its parts acquire properties from the design that they would not otherwise have. Therefore, it is possible to have a feasible design none of whose elements, considered separately, are feasible. Moreover, design tells us about the society in which we live. Buckley (1987, p. 10), the design historian, recommends the study of design because "it is a process of representation. It represents political, economic, cultural power and values Designs, as cultural products, have meanings encoded within them which are decoded by producers, advertisers and consumers according to their own cultural codes." According to the editors of FAN's (Feminist Arts News, December 1985) issue on design:

"... design is so pervasive in our lives. We sit on it, live in it, eat off it, work with it, read it, see through it, wear it. As a branch of professional expertise design works on environments, objects and images. It's also an everyday activity that most of us engage in. Design has an economic role and social effects. Since the processes that lead to the formation of commodities are crucial to material culture, design as a terrain needs to be understood. ... as we live in a material world largely not of our making (though with consent) and our role is predominantly to respond or consume rather than one of initiation and production."

Asking question about design and its application inevitably leads to the debate about consumption and production which is the emphasis of this discourse. For example, it is said that the machine which was 'best' from the point of view of the producer was not necessarily 'best' from the point of view of the consumer. What shows as 'consumer choice' is, therefore, more likely to be 'producer choice', especially for resource-intensive products. Cowan (1983) suggests that the first question which should be asked about a new device is not 'Will it be good for the household?' - or even, 'Will householders buy it?' but, rather, 'Can we manufacture it and sell it at a profit?' He claims that consumers do not get to choose

among everything that they might like to have, but only among those things that manufacturers and financiers believe can be sold at a good profit. Profits are always the bottom line. This is a criticism also made by Papanek (1984, p. 252) who asserts: "Design must be independent of concern for the gross national product, if it is genuinely to serve, rather than exploit, society."

The relationship between people and the places which they use is the fundamental issue in design. Boys et al. (1986) says that such an approach takes the emphasis away from products and objects, and points it towards relationships and meanings. These relationships are described by Goodall et al. (1985), who strongly oppose the idea that design should be intrinsically or even normally, concerned with producing 'things, rather than social and economic relations or ideas, pleasures, miseries'.

By referring to the history of design in the West, Whiteley (1993) claims that the late-1960s ferment resulted in the development of several lines of thought in the 1970s which he classifies them briefly as:

- a) the alternative technology movement; (which eventually became known as the appropriate technology movement and in which decentralized and ecologically sound energies and materials and non-alienating social means of production were supported.)
- b) a movement which was a concern to design shelters for the Third World or the victims of earthquakes or other natural disasters; (an example, designed in Germany for those made homeless by a Peruvian earthquake, was an igloo-sized balloon sprayed with polyurethane foam to form a temporary shelter.) and
- c) a third movement was the total rejection of architectural or design practice. [This was the option chosen by radical designers who, in order to avoid compromise with the system they despised, gave design up completely in favour of direct-action politics. Anarcho-left direct political action, for example, was proposed by the ARSE group (Architectural Radicals, Students and Educators) in London who proclaimed that they should build for society by building a new society first.]

Another position developed by Buckminster Fuller (1972) who believed design could solve the world's problems, if it dealt with the real issues and concerns, rather than the phoney desires dreamt up by capitalist manufacturers and their designers. His utopianism was based on an extreme rationalism and a total commitment to science and technology. He rejected all forms of broader political involvement because they got in the way of the utopian vision:

"It seems perfectly clear that when there is enough to go round, Man will not fight any more than he now fights for air. When Man is successful in doing so much more with so much less that he can take care of everybody at a higher standard, then there will be no fundamental cause for war ... Within 10 years it will be normal for Man to be successful. Politics will become obsolete."¹

Fuller offered a vision of compassionate, problem-solving, anti-consumerist design to those who dismissed or reflected politics as part of the problem rather than part of the solution. Decisions about design, Fuller and his followers thought, were too valuable an activity to be entrusted to self-seeking politicians (Whiteley, 1993)².

Furthermore, another emphasis is given to the notion of 'tradition' as a significant source for realizing the design both as a problem solving process and a creative action. This line of thought believes that there is a direct link between a society's design and its social health and identity which is also the core of the tradition: design is a manifestation of the social, political and economic situation. Whiteley (1993, p. vii) states: "The strength of the tradition is that design is firmly grounded in a relationship to society rather than being presented as an area of study which feeds only on itself; its weakness has been that, in both the nineteenth and

¹ See James Meller, Ed., 1972, *The Buckminster Fuller Reader*, London, p. 376.

² Fuller's ideas were celebrated at conferences and events in both the United States and European in the late 1960s and early 1970s. At these gatherings alternative shelters and sources of energy, including wind-powered equipment, were tried and tested; geodesic domes were erected; and temporary shelters made from cardboard were constructed for use in disaster areas. Books and manuals of a semi-underground nature followed. These gave information on do-it-yourself construction and easy-to-get parts. The Whole Earth Catalog, an imaginatively compiled directory of services and techniques, was periodically updated and widely available; the Domebook One, 'inspired by the work of Fuller', gave a practical account of the construction of ten different domes (Whiteley, 1993).

twentieth centuries, design reform writing has been on occasions little more than a cover for professional middle-class taste masquerading as ethically superior - 'good' - design."

John Ruskin (1984) pinpoints a significant role of tradition and says that architecture is to be regarded by people with the most serious thought. He claims that people may live without her, and worship without her, but they cannot remember without her. The thesis's stress has been illuminated by a citation of Steil (1987) who also has a definition of tradition when he states that **tradition is always young, fresh and new**; not a defence of the old, the ancient, or the antique. He believes, as the author does, that **tradition is a project about continuity, based on memory, common-sense and experience**. A definition from The Oxford English Dictionary refers to a significant point in the meaning of tradition which emphasis on the principle of transmission and indicates: "Tradition (Lat. tradition, -onem): 4. The action of transmitting or 'handing down', or fact of being handed down, from one to another, or from generation to generation; transmission of statements, beliefs, rules, customs, or the like, esp. by word of mouth or by practice without writing."

Tradition is also a major issue in contemporary architecture. Tradition is as much a natural way to develop design as it is the best way of ensuring that a building is soundly constructed. Adam (1992, p. 20) sees the continuity of the past we all share as a basic fact for this development. He says: "This continuity and the patterns of behaviour and codes of understanding that have grown out of it are our traditions. Such traditions define and have always provided the identity of a culture." To him, traditions do not recreate the past but continually develop out of social, cultural and physical inheritance, so responding to the inevitability of change without resort to the forces of revolution. The past is, for Hopkins (1991), an increasingly important source, but a source that must be reinterpreted in relationship to contemporary conditions and needs.

The author suggests that it is conceivable to imagine a kind of tradition which is neither stylistic nor guided by dogma, but supports consistent attitudes and approaches to questions of materials, fitness for purpose, and the relationship between the inside and outside of a building. MacCormac (1992) has praised the Arts and Crafts Architect and said that in

architecture the significance of buildings is not just in their appearance and aesthetic, but in the quality discovered in their use, in the use of places, not spaces, and in the use of things which convey their sense of fitness in the way they are made. He seeks a 'reciprocity' between a sense of tradition and the condition of modernity; this will result, he hopes, in a culturally authentic and aesthetically appealing architecture that avoids today's too frequent superficial uses of styles which substitute for real architectural thought. He has argued that: "... we confuse the appearance of architecture with its spirit ... Architecture remains an oral adventure and I believe it has to keep transforming tradition to re-awaken meanings, rather than imitate old forms." (p. 23)

The author would like to argue that the issue of tradition in architecture is part of a wider debate about tradition in society. The problem of achieving a balance between tradition and modernity, between continuity and change, or stability and innovation is complicated by a society which is both increasingly plural and decreasingly guided by tradition. Some practices and achievement in architecture demonstrates that tradition and modernity need not be in conflict; that tradition need not imply 'traditional' in the sense of 'old-fashioned', nor even be conventional in appearance. Tradition is a term which should be used carefully and critically. This is a point made by the philosopher Karl Popper (1949, p. 28):

"... There are only two main attitudes possible towards tradition. One is to accept tradition 'uncritically', often without even being aware of it. The other possibility is a 'critical' attitude, which may result either in acceptance or rejection, or perhaps in a compromise. Yet we have to know of and to understand a tradition before we can criticise it"

2.B.1. The Role and Status of Design in Society

The mood seems to be now right, after having a brief review about design, for a reassessment of the role and status of design in society. The design writer Myerson (1990, p. 13) has pinpointed the fact that design is "fast becoming a weapon of exclusivity, of segmentation - the means by which many desirable goods and services are put out of reach of large sections of the community." Its role needed urgently to be reconsidered. The designer Henrion (1987)

attacked the prevalent notion of design as "the yappy fun of a moneyed minority", arguing that "the designer's place in the economy is of crucial importance but his place in society is no less so." He cited the economist-philosopher E. F. Schumacher who was, he believes, particularly relevant to the current situation: "What is at stake is not economics but culture; not the standard of living but the quality of life."

Repackaging and redesigning are part of a socioeconomic system that assumes limitless growth and a continual state of desire. The modern consumer's condition is characterized by dissatisfaction and a consequent state of longing. It is said that a continual stream of 'new' goods is produced to satisfy temporarily the desires which the market has, if not created, then certainly kindled. It is not forgettable that this system is part of a global context in which majority of people have an inadequate supply of the necessities of life. This situation becomes worse by the rapid growth in world population. Many believe, as the author does, that we are now being forced to recognize the finite character of some of the resources required to meet those rapidly growing human needs, and designers are beginning to realize that the consumption of energy needed to produce the basic goods and services demanded by the growing world population, and to meet the expanding markets of the Developed Countries, will destroy environment through the 'greenhouse' and other effects. This raises questions about the morality of design and the ethical responsibility of the designer which have been discussed briefly in Section (g) of Appendix One.

2.B.1.1. The Designers

The designers have a key role to play in qualification of design. They are in a special position between the producers and the consumers and can influence both parties. The designers can have a major influence over how things are made: the materials that are used; how they are constructed; how efficient they are to use; their ease of maintenance; and even their recycling/reuse potential. What the designers urgently need is accessible, understandable and reliable information about materials, processes and their effects. Many institutions have been founded to provide databases that will enable a designer to make an informed decision. There is also a growing body of ecologically aware and technologically informed designers and groups who are beginning to assert an influence on mainstream design thinking.

Likewise, many designers are also deeply suspicious when they hear talk about such notions as 'the designers' social responsibility' and 'socially useful products'. First, because it may harm their own financial prospects. Second, they find such notions taboo, politically and ideologically. There are also revolutionary ideas which follow Fuller's (1972, p.36) proposal to the International Union of Architects at the 5th World Congress in London. He suggested:

"... to officially initiate phase 1 of Design Science Decade 1965-75 which will put world on notice that making world work is an invention initiative and not a political responsibility and is only solvable by a world design revolution which is the only revolution universally tolerable to diverse political interests of the world; and that the design revolution must be conducted by world-around students under university auspices and supported by professional degree accrediting boards and visiting committees of all architectural, engineering and scientist professions and officially underwritten by their professional societies."

In the same line of thought, Papanek (1984, p. 85) refers to professional education from different angle. He believes that training the designers to train designers would become a 'seed project' helping to have able designers. This is similar to the idea suggested by the initiators of Selseleh Project, the development workshop in 1976 (see Chapter Five for more details). It was exercised in Iran, Egypt, Sudan, Oman, India and Turkey, but was not effective enough to sustain. The reasons may lay in the fact that any idea of this kind needs an appropriate context, such as radical changes in development programmes which can be seen as contextual frameworks for design.

One honourable compromise for designers has been to work in the public sector, but this has become less effective as a strategy for two reasons: first, the public sector in most countries is decreasing because of 'privatization'; and second, the remaining public sectors are having to adapt to 'enterprise culture' criteria in which '**use-value**' is superseded by '**exchange-value**'. Units for socially useful products for disable people, for example, usually only exist on a short-term basis, funded by a council with a social conscience, or by a voluntary organization relying on charity and goodwill (Whiteley, 1993).

The thesis's concern is about the problems which has been observed since the arrival of affluence and saturated markets ideologically and practically. The need of considering design historical, social, economic and political contexts should be kept in mind for understanding its value system. Cultural habits are as difficult to change as an economic system because they are formed by that system. The marketing-led design placed an emphasis on design both because a designer lifestyle was presented as if it were the ultimate state of psychophysical being; and because it was thought to be the panacea for society's economic problems.

2.B.2. Design for the Real World

The most forceful and articulate voice of dissatisfaction with design was given with the publication of Papanek's proposals which was published originally in Swedish (1970) and later in English (1971). Exposing the values and ideology of the consumerist societies, critiques, such as Green critique, were also developed in the West during 1980s, which has been explored thoroughly in Section (h) of Appendix One. In the following, there is a set of six design properties proposed by Papanek which was an agenda for design and yet can provide some guidelines for radical design thinking:

1. design for the Third World; (Papanek calculated that nearly three billion people were in need of some of the most basic tools and implements.)
2. the design of teaching and training devices for retarded, handicapped or disabled people; (Papanek argued that this area of design, which was often dismissed as 'design for minorities', constituted a larger area that was generally realized.)
3. design for medicine, surgery, dentistry, and hospital equipment; (instruments were either badly designed or over-designed.)
4. design for experimental research;
5. the design of survival systems for difficult environments such as polar icecaps,

underwater, deserts, or space; (systems design for sustaining human life under marginal conditions.) and

6. design for breakthrough concepts.

This final priority was a justification for radical design rethinking rather than the conservative approach of a continual refinement of existing products, or systems of 'additive' design in which more and more features or extra gadgets are added instead of reanalysing the basic problems. Automatic dishwashers and the heating of rooms are kinds of problem that Papanek believed need rethinking in terms of energy and cost. This is also similar to the interactivists approach to the problems and is the thesis's concern in solving development problems which has been reviewed in Problem Identification.

Papanek also suggests concrete ways in which designers who want to work responsibly can survive in a consumerist society. He suggests contributing one-tenth of their time or one-tenth of their income to socially responsible projects, while continuing with their jobs. This is an idea that has increasingly appealed to younger designers, and organizations such as those organizations which act as a creative broker between sympathetic individuals or groups in the creative professions and environmental clients. These organizations usually contribute research, planning, project management and production skills to ensure that campaigns are as successful and creative as possible.

2.B.2.1. Third World Problems and Priorities

There is a tendency in the Developed World to expect the Third World to avoid the former's mistakes in such matters as energy production and environmental pollution. Third World Countries; on the other hand, resent both being told what is good for them, and having to pay for the mistakes and high living of the West. Some commentators suggest that the logic ought to be in favour of responsible design: Third World Countries are characterized by scarcity rather than surplus and merely owning a product ought to matter more to people than its particular make or styling. Yet, few Third World Countries are cocooned from Western values when it comes to design. The role of products in conferring status and power is daily

transmitted on Western television programmes which are followed avidly in shanty towns from India to Brazil.

Even if the dilemma of design in a Third World country is resolved in favour of socially responsible design, the designer has the difficult task of conceiving products and processes which are not only socially desirable but also culturally appropriate. For a product or process which does not grow out of the habits and customs of a country or region is unlikely to be successfully integrated into the society's culture. Therefore the author's argument is that products introduced to aid a group's economic development have sometimes failed completely because they did not take full enough account of the cultural factors of tradition and identity. **Therefore, it is necessary to mention that taking a simple approach to design as a problem-solving activity is not sufficient, rather design is a cultural activity in which meaning and identity relative to a group, society or country are essential considerations.**

Technological processes of production, which have been also referred to as an important fact, have to be 'appropriate' to the culture of a country or region. Much has been written about 'AT' (Appropriate Technology), and its relationship to responsible design in Third World Countries cannot be neglected. Carr (1985) briefly classifies the main characteristics of appropriate technologies as:

- a) low in capital costs;
- b) use local materials whenever possible;
- c) create jobs, employ local skills and labour;
- d) are small enough in scale to be locally or regionally affordable; and
- e) can be understood, controlled and maintained by local groups wherever possible, without the need for a high level of Western-style education.

Furthermore, they involve decentralized renewable energy sources such as wind power, solar energy, water power, or muscle power and are understandable to the people using them. They are unlikely to involve patents, royalties, consultancy fees or import duties, as these tend to maintain the reliance of Developing Countries on Affluent Countries. A survey in Chapter Five

will illustrate other properties of this movement which have been also the concern of Underdeveloped and Developing Countries' experts. Finally - and this is facilitated by the 'people rather than technology' emphasis of AT - they need to be flexible so they can adapt to changing circumstances.³ Much of the thinking behind the values of AT is said to be derives from another key book of the early 1970s: Schumacher's 'Small is Beautiful'.

Cultural and technological considerations become especially crucial when a 'socially responsible' designer takes on work for a Developing Country. There is a grave danger that the designer sitting in her/his office in London, New York, Milan or wherever, will lack crucial knowledge about the culture of the Third World Country. Even if the designer visits the country for a period, there is still a danger that s/he cannot become involved long enough or deeply enough to fully understand local customs and needs⁴. Ideally, Papanek (1984, p. 85) refers to this point that the designer should move to the country or be a part of that society in order to: "... train designers to train designers. In other words, **he would become a 'seed project' helping to form a corps of able designers out of the indigenous population of the country.** Thus, within one generation at most, five years at least, he would be able to create a group of designers firmly committed to their own cultural heritage, their own life-style, and their own needs." [This is the author's emphasis, see Chapter Five about supporting practical schemes and also Hassan Fathy's (1973) work in Egypt.]

2.B.2.2. Designing with Indigenous Knowledge⁵

What usually happens is that people's indigenous or tacit knowledge is not drawn upon. Design methodologist acknowledge that 'indigenous knowledge' is an essential component of the skills and qualitative decision-making processes of the designers. **There is a difference**

³ See Carr, Marilyn, 1985, *The AT Reader: Theory and Practice in Appropriate Technology*, Intermediate Technology Publications Ltd., London, pp. 8-9.

⁴ The reason may lay in understanding the model of endogenous development theory whose emphasis is on the process of life which involves design process using feedback control and user's participation [see Chapter Four, The Model (4.B)].

⁵ See Introduction: people's participation in design process; Chapter One: Problem Identification; and also Chapter Four: The Model (4.B).

between 'knowing what' and 'knowing how'. The former refers to the explicitly stated rules of doing something; the latter is the implicitly and internalised knowledge of doing something. **'Indigenous knowledge' is knowledge people know but cannot tell; it is intrinsically nonverbal, is derived from experience, and often makes the difference between doing something in a satisfactory manner, and doing it well.** Anyone can learn what to do by following the rules or instructions for an activity such as cooking or playing, but it is only once one has internalized the rules and developed a feeling for the activity, based on experience and the need for judgements and fine tuning, that s/he likely to do it well. Of course, the criterion of goodness or success in an activity may vary. This is indeed what happens in design. While this section on indigenous knowledge is addressed so briefly, it is in fact the bases of further development in the thesis (e.g. in Chapter Three and Chapter Four) which defines its central theme.

2.B.2.3. Symptoms or Causes

The problems associated with design and some of their solutions were discussed in the previous discourse. As it was reviewed, many relate design problems to the process of production and pursue their solutions while seeking for their qualifications. In this regard, the author would like to focus more on two interconnected aspects of production processes, i.e. social and physical. The most obvious example of a socially destructive process of production, from the Industrial Revolution until now, is the human conveyor belt: the type of work that demands mindless repetition with the minimum of satisfaction. It is apparent that the changes in the character of human labour have been as profound as the revolutions in the 'instruments' of production, that is the technologies, with which labour transforms nature (Charley, 1994).

When it was found that complex and skilled operations, broken down into simple, repetitive and frequently unskilled tasks performed by the same individuals, resulted in a greater number of units being produced, social working conditions were transformed (Ibid.). In this regard, Whiteley (1993) identifies the term 'Scientific management' as it was a concept and approach coined by Frederick Taylor⁶ at the turn of the

⁶ It was also known as 'Taylorism' (Whiteley, 1993).

century. He says that it has developed through the years into the disciplines of 'operational research' or 'cost accounting'. It has also proved to be able to ignore natural process, slowly stripping away all that is left of the autonomy and independence of the craft worker, and slowly reducing labour to its simplest and most abstract form.

Gramsci (1986, p. 302) describes **Taylorism** as an expression of the "brutal cynicism of American society" that was leading to the break up of "the old psycho-physical nexus of qualified professional work, which demands a certain active participation of intelligence, fantasy and initiative on behalf of the worker," a system that reduces "productive operations exclusively to the mechanical, physical aspect."

There are strong arguments to suggest that Taylorism gave birth to Fordism, the genesis of the total regulation of life at work, at home and at leisure. As a tendency in the development of capitalism, **Fordism** is described, by Aglietta (1979, pp. 116-117), as "articulation between the process of production and mode of consumption, which constitutes the mass production that is the specific content of the universalisation of wage-labour." In other words, Fordism describes a moment in the history of capitalism, when a transformation in the labour process based on semi automatic assembly line production, revolutionises work and with it, everyday life (Charley, 1994).

The emphasis remains the same: the maximization of human and technical efficiency - usually involving incentives for piecework and unsociable hours to ensure that the factory's machinery is utilized without stoppage. Hierarchical organization of modern industrialization (Taylorism and Fordism)⁷ has also called saddled the modern world with the materially enriching but humanly brutalizing hierarchically organized assembly lines of mass production (Waddington, 1977). Another concern of the thesis is to emphasize that most industrially designed goods are manufactured in this way.

Charley (1994, p.164) indicates that the process of industrialisation leads to complete

⁷ See also Chapter Four: The Model (4.B).

interdependence of different social practices. He pinpoints the independency of different social practices in the industrial societies and says: "It is not surprising that so much 19th and 20th century philosophy and critical thought became preoccupied with the notion of a world in which all things were in some manner connected with each other, either as an 'expressive' or a 'structured' totality." Then he claims that, for the first time, the economic, the political and the aesthetic merge together in a social totality that is impossible to ignore and is all embracing in its simultaneous unity and disintegration in the modern world.

As a solution for industrial problems, some companies attempted to reduce the monotony by introducing a degree of multipurpose activities into the job: the worker is made responsible for several tasks, or tasks are swopped between workers every so often. So-called 'quality circles' are supposed to increase the quality of the product by enriching the worker's job. But, most Greens dismiss this as superficially patching up a system that is fundamentally flawed. In the words of Irvine et al. (1988, p. 68), **"While it might be more fulfilling to be involved in the construction of a product from start to finish, real progress depends upon its social and environmental value."** Others posit that robots are the answer to mind-numbing, routine work, but the effects of increasing automation on unemployment are well-known.

In this regards, Whiteley (1993) refers to Greens who focused into two directions because of these problems: First, Those who reject all but the most essential automated, mass-production processes because of their direct or indirect human cost, and to seek a return to an essentially craft-based means of production in which individual workers have greater participation and control. Secondly, those who prefer the idea of the 'two-tier economy' in which comprehensively automated, state-of-the-art mass-production methods are used to produce society's commonplace daily items, alongside highly skilled and often labour-intensive craft or hand processes that are satisfying to the maker. The author suggests that the process of producing the built environment needs special concerns. Because the process for achieving a viable, exciting and humane built environment is very complex, it calls for contributions from many individuals and small multi-disciplinary groups of problem-oriented task forces. Each task force member should be intelligent, creative and committed while being highly proficient in her/his own field of work. S/he must also be a good generalist to induce or abduce and be

capable of working with the group (see Chapter Four: 4.B). This approach is embedded in the endogenous development being holistic. It derives its laws or characteristic from the various aspects that characterise societies which is of notice or adopted in the model.

It was argued in Section 1.A.5., The Purposeful Systems and the Problem, that **the ability to take the corrective action, which required to learn and adapt, depends on the flexibility and changeability of the control and controlled systems.** Parkinson (1957) states that it is possible to design flexibility into mechanical systems but it is much more difficult to design it into purposeful systems. The contemporary interdisciplinary approach puts a variety of disciplines to work together on the problem as a whole. For example, experts in health, housing, transportation, education, and other aspects of urban life work together on the city wide problems taken as a whole.

Ackoff (1974) points to an important objective of many interdisciplines by saying that since 1940 some of these have been developed to generate and apply understanding of the mental processes, which are the basic factors for development and utilization technology, and their role in control. These interdisciplines included: for example cybernetics; operation research; the behavioural, communication, management, and policy sciences; and systems engineering. He suggests that such interdisciplines provided the "software" of the Postindustrial Revolution. Since then, many concerns have been shifted towards multi-disciplinary approach and new interdisciplines have been emerged.

2.B.3. Creative Thinking

Nowadays, the mood for reassessment is particularly strong amongst a new generation of designers in Developing and Underdeveloped Countries who are more able (or willing) to grasp the connection between their own professional activities and the problems facing society. The first step in the reassessment might be to identify the word 'creative', which has become as abused by many professionals a term as 'design' and 'designer'. Whiteley (1993) claims that in the 1980s the most trivial change of detail on the package of a product would be hailed by its designer and the design press as 'a creative redesign'; the 'creative professions' seemed to be those that successfully designed new designer-clothes for vain emperors; and

'creative accounting' seemed simply to be a euphemism for legally getting away with financial murder. Although creativity can be the essential part of design, but the thesis's concern is that its assessment needs to go deeper than the surface problems, which are merely manifestations of a system that has intrinsic faults.

The creative process requires basic honesty and integrity. It is also referred to as a process that is often very painful and financially unrewarding. It demands much time, hard work and commitment. The immense energy spent is often abortive and the end-products are not always successful. For judging the result of a creative process, Lim (1990, p. 96) suggests: "The innovative and creative individual cannot lie to himself, as he is his own judge. If he attempts to copy or imitate, he cannot reconcile with himself." The same source also highlights the point that creativity has been divided into two streams. The controversial writings of many writers have challenged the accepted ways of '**thinking**' and '**problem-solving**' and presented new possibilities. Lim believes that innovative approaches, at times with less effort and pain, can offer remedies to apparent insoluble problems.

'Creativity is a lonely act, but design is among people.' This is a quotation from John Habraken's book 'The Appearance of the Form', published in 1982. He claims that design is an activity by people and for people; creativity is an individual act within the seclusion of one's own territory, a territory which on itself has to be created and agreed upon. The author's concern is that **creativity is a mental faculty which everyone has and is certainly not the choice of artists, as is the common belief.** This means that the quality of design can be increased by using the creative power, not only of architects, but also of users, principals, public and private bodies, structural and physical advisers and contractors, etc.

2.B.4. Users' Participation in Design Process

For designing the future or solving the existing problems, either by planning and design - whose trends are towards future - or by management - which involves decision making thus problem solving (see also Figure 1.A.1) - there is a need for understanding the mental process. Another point is the complexity of some products which requires a multi-disciplinary approach. Concerning these points, the author would like to focus more closely on his field

of study and to shift the discussion into a discourse on the process of planning, urbanization and architecture, as fundamental bases for designing the built environment.

Therefore, the author's attempt is to define the role of user participation in the design of the built environment, the effectiveness of professional support as technical aid, the difficulties of involving users in the design process, and what can be done in situations where direct participation may not be possible. Finally, the underlying assumptions about users' needs and wants are discussed. Many of these issues may be still unresolved, and this discussion, therefore, adds a timely and useful contribution to the continuing debate.

The problems relating to environmental identity and urbanism are highly complex and can only be resolved by the collective inputs of many committed individuals working in different disciplines. The task is difficult but it has to be undertaken with all the diligence, ingenuity and wisdom at their professional command, if their newly created urban environment is to meet the emotional and psychological expectations of future generations (Lim, 1990). Meanwhile, some professionals in built environment predict that by the year 2020 many urban centres would have changed substantially. Without serious efforts to correct the present developmental directions, the squatter numbers will drastically increase. The present urban infrastructure is inadequate to meet the challenge ahead. There are no easy solutions, as the conventional theories are yet to produce satisfactory answers.

Some ways must be found to involve the users. Is it not conceivable for the individual user to be permitted and even encouraged to be responsible for the design, colour, materials and the external façade of his unit and also for the arrangement of the internal partitioning? Planning regulations in many countries do not allow this flexibility. Furthermore, the designer has to reexamine her/his creative process before such an intermediate and continuously changing design solution can be offered. An effective users' involvement can make important contributions to environmental identity. Irrespective of the social and political system, some basic rethinking on this issue is called for. Users' participation is recommended to be encouraged, designers' image to be reoriented and planning regulations to be amended (Ibid.).

Scott et al. (1986) pinpoint three essential ways for users to participate in design of their built environment. They were also the special characteristic of 'Community Architecture' which were propounded in Working Papers No. 95 published 1986 as followings:

1. consumer control over the built design;
2. the wholehearted support of the principle of consumer control by the designers concerned; and
3. the designer's direct accountability to the consumer group for the built design.

Consumer control was also one of the hypotheses in the Tom Woolley's paper in the conference held at Oxford Polytechnic in late 1986. He found consumer initiative and control of the direction and management of the project more than anything else characterized the highest level of user satisfaction. He identified three main claims of community architecture:

1. the intervention of architects will help to solve the problems of social and urban deprivation which is due to a lack of access by low income groups to professional resources;
2. users will be more satisfied with the results if they are involved in the design and development process of buildings; and
3. people will look after the environment better if they are involved in the design and development of it.

Furthermore, the author's contribution on users' participation in design process is seen as supportive to the main objective of this chapter. It will, however, be addressed in more detail implicitly in the Chapter Four: The Model. It is worth mentioning to reiterate that the thesis's concern is that design is not the end, but it is a means to satisfy the ultimate desire and the real needs of the society. The main goal of participating people in construction of the built environment is, therefore, to help them to have an evolution of their world views and culture by increasing their experiences (Islami, 1996a). For instance in life process of a single building, we may find many lessons to be learned. As it is illustrated in Figure 2.B.1, there are stages and periods during a building's life. This process involves three states of human motivation,

i.e. 'creation', 'adaptation' and 'restoration' whose functions are either 'producing', 'experiencing' or 'sustaining'. The activities needed for each process are; 'designing', 'constructing', 'using', 'maintaining', 'conserving' and 'renewing' which are, in fact, a starting point of another process. The involvement of participants in activities differs from minority, agencies and individuals to majority, communities and families. In other word, it differs from public to private.

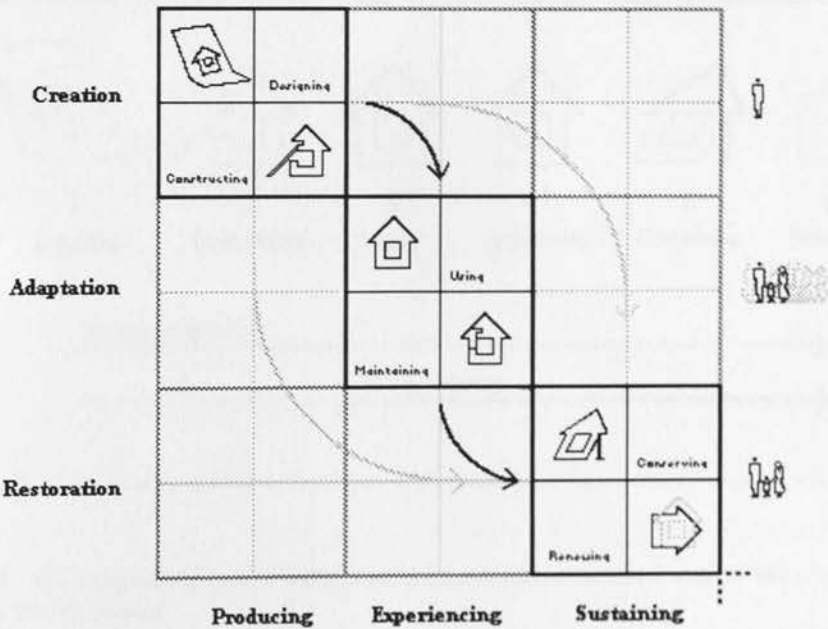


Figure 2.B.1 The life process of a house
This responds to the people's states and creates different activities.
Source: the author

People are mostly active in experiencing the built environment. They are also responsible for restoring it. The effectiveness of their work differs from place to place. Sometimes, lack of proper laws and enough members of agencies for sustaining buildings and spaces, leave the owners alone. It seems that a mass of experts in first part of the process with emphasis on creativity reduces the role of the users. But, all the parties, involved in each activity, work together in 'natural or cyclic processes' which is illustrated in Introduction, in Figure 1.

By reducing the collective action of different stages of production into specific activity, the link between the parts of the chain might be missed. This is what happened in the industrial

and post industrial era. Therefore, a big gap appeared between each party and the others. In general language, there exists a wide gap between the users and the producers. Concerning the thesis's message which is illustrated in Figure 2.B.2, each party who is participating in the life process of a building, especially designers and users, should be responsible for all the procedure. Therefore, it would be worthy if they cooperate in all the stages of the process to bridge the gaps, especially in the design process, as if the designer and user are one-person.

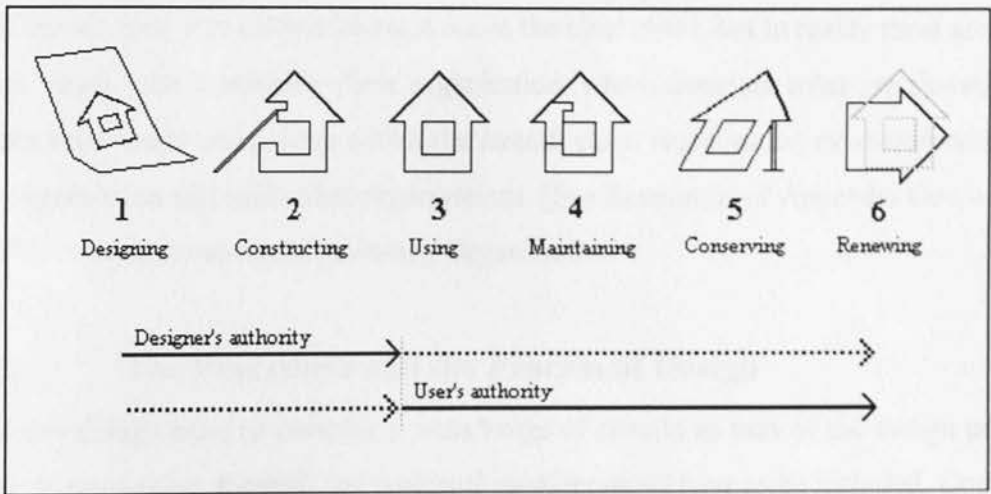


Figure 2.B.2 The designers and users' authorities in the activities associated with the life of a building
Source: the author

Participation was also questioned as introducing a new element in the process which can lead to a whole new range of problems. Indeed, there are conditions under which participation may be impossible because of the type of client or nature of the projects. Even where participation is possible, the central question about who the client is, and which of the many groups to include remains only partially resolved.

Bacon et al. (1986, p. 31) define the clients and write: "The client is typically inexperienced, generally an individual or small organisation commissioning an architect for the first and probably for the only time." They then summarize six roles which have to be undertaken by the clients in a brief as:

1. financial role;

2. decision making role;
3. developer role;
4. briefing role;
5. information providing role; and
6. user role.

They say that all six of these may be undertaken by the same person, who has no interests to consult but his own. For many architects this is the ideal client, but in reality most architects have to work with a complex client organisation, where these six roles are shared either between individuals and groups within the overall client organisation or shared within the client organisation and with other organisations. [See Section (i) of Appendix One which is a brief discussion about The Community Organizations.]

2.B.5. The Procedure and the Process of Design

Designers already have to consider a wide range of criteria as part of the design process: marketing, production, financial and technical considerations have to be included. Compared with these, environment considerations could be even more complex and hard to handle. The designer's task will become more difficult and more important, demanding changes in attitude, education, approach and sophistication. The design skills required may change too, as many economies continue to shift from manufacturing to service-based industries. There are very often no clear answers; information is hard to find; guideless may not be available; so much original research and thinking may be necessary. What general changes might one expect to see in the design process, given the need to incorporate many criteria (MacKenzie, 1991).

Beside the description about Modernist attitude towards design process mentioned before, Whiteley (1993) states that if the design process comprises creation, production and consumption, then Modernist Designers placed an overwhelming emphasis on their own creativity and the demands arising from the processes of mass production. Consumption, he says, was a presumed end-result as, indeed, was manufactured; in fact, most Modernist Designs reached only the prototype stage, and were produced by craft techniques or manufactured in very small quantities. **The consumers' subjective responses to an object**

were ignored in Modernist Design. He continues his discussion by pointing to the fact that **design in the Modernist world - supposedly rational, unsentimental, functional and serious - was about how architects and designers felt people should live; it did not grow out of the way people do live. The psychological role of material culture was not acknowledged in this rational world with its rational aesthetic.** [The author's emphasis]

In relation to the Feminist Design and the appropriate situation for women, Rosy Martin (1985, p. 26) refers to the process of design, which can be seen as a part of production process, and pinpoints: **"Women [People] need to gain knowledge of the means to affect the decisions that control their material and social environment [or process of their lives]⁸. Then designers would be better able to serve them, rather than perpetuating the power imbalances."** [The thesis's emphasis which will be discussed later in Chapter Four.]

Referring to the fundamental conflict of values highlighted in a 'face to face' conversation and transcribed in Creative Review, between Fitch and Boys in 1986 about retail design boom and whom it benefited. Boys (1986, p. 28) identifies the fundamental issues such as:

"... the relationship between people and the places they use and live in A lot of the environment is treated just on the level of appearances. Design becomes a series of events you pass through once. The city becomes a chaotic place, full of random, uncontrollable events, which can either excite you or alienate you depending on your resources. Whether or not you have a car or money affects your relationship with the environment."

The key point in such discussions reveals the importance of function and form and their relationship. Thus, the relation of form to function is strongly mediated by the syntactic rules under which a designer operates. Mitchell (1990, p. 1), for example, defines architecture and says that the beginning of architecture is empty space which is characterized by Plato in the 'Timaeus' as "the mother and receptacle of all created and visible and in any way sensible

⁸ Life process, production process, design process and their relationships is explained with special concentration in Chapter Four (4.B).

things." Architecture, in fact, is an art of distinctions within the continuum of space and place, for example, between solid and void, interior and exterior, light and dark, or warm and cold.

So far, the significance of users' participation, as a way which usually leads to qualification of the products, has been discussed. Participation of users is also considered to be the leading principle, with all professional parties involved in the design process, for the definitions of 'design activities' as fundamental bases of design processes. Regarding this point, Bax (1989, p. 20) writes: "Articulation of space in a formal and a functional dimension is defined that they potentially correspond with the articulation of a design procedure in controlled activities."

The same source proposes a three-dimensional model (i.e. Gom-Model) for the classification of design activities in order to analyse and design architectural design process. It claims that the traditional two dimensional form-function concept of architectural design is made operational by completing it with a third dimension⁹: the model found its application in the study of 'natural' design processes as a necessary base for the design of 'artificial' design processes or design strategies [see Section (j) of Appendix One about Design Process]. The model provides also the structure for decision support systems, its databases and programme modules. He believes that this will provide an instrument for the study of design processes and a conceptual map for the planning of participatory design processes, taking participation as the main viewpoint for the **identification**, **definition** and **specification** of differentiation of design activities in public and private responsibilities in planning and design.

As it was reviewed, design is a controlled objective oriented and problem solving process. Because of the cultural process of differentiation in the field of knowledge contributing to the design of architectural artifacts, it becomes more difficult for an individual designer to cover the complete field of architectural design. Knowledge, experience and creativity of various designers on all levels and domains of architectural design have to be coordinated so that they can act as participants in a design process. Design, Bax (1989) suggests, is a 'decision making process within the frame of a 'design coalition team'. Every actor or party in this process is

⁹ The process (ordinance, integration and development) is the third dimension for Bax which transforms different states (level, domain and phase).

motivated by the common goal of the team and by her/his own interest and goals.

To create conditions for all these parties in a controlled and coordinated process, the structure of this process has to meet specific criteria. The process has to provide a structured 'space' as design fields and tasks for all these parties to supply their knowledge. Therefore, the author would like to suggest that participation is, mostly for reasons of efficiency, the leading principle for the structuring of these processes (i.e. the abductive¹⁰ side of the picture). It is the leading principle not only to meet the social demands on the highest qualitative level (i.e. the inductive side of the picture), but also to create conditions for innovation as an economic phenomenon.

2.B.5.1. Different Stages of Design Process

Design is a process in which a form is tuned to the demands of its social and technological environment. Alexander (1970) refers to these demands as 'context', Habraken (1982) and Lawson (1980) as 'constraints', Bax (1989) uses them with the reference to the conventions of professional language 'function'. Function and form are complex entities and there are lots of fits feasible between various functional and formal categories before there is a total fit, which means consensus between all the parties involved. These categories of functions and categories of forms are defined as 'design fields' (Ibid.).

'Levels' are characterised by a set of elements, but also by the type of situations, e.g. buildings, neighbourhoods, districts, ..., modules and grids. During design process, designers have to surpass the systems theory of mechanical notion of 'composition order' (system view) to the hierarchical notion of 'action order' (structuralism). Process transforming objects to higher level is called 'inductive' process, and processes transforming objects to a lower level is called 'deductive' processes. The inductive processes result in 'models' and the deductive process results in 'plan' (Ibid.). It is important to notice that on each level a complete description is made of an architectural object: on a high level the elements are large and complex, on a lower level the elements are smaller and less complex; high complexity means, in this respect, that

¹⁰ Deduction, abduction and induction preferences have been implicitly explained in Chapter Four: 4.B.

much specification is possible. [See Design Process in Section (j) of Appendix One.]

Some categories of functions which are on a high level of abstraction are described in the so called 'domain theory'. In this theory, the domains explain the state of the subject and its dynamics like the domain of 'utility', the domain of 'durability' and the domain of 'manufacturability' (Ibid.). The author would like to use an example from architecture which is restricted to the category of so called '**instrumental**' functions and to talk about columns. A column is described about the three domains. In the domain of utility the column differentiates space in different fields of use, suitable for specific human and social activities. In the domain of manufacturability the column has meaning in terms of material, labour and tools. In the domain of durability the stability through time of the column is subject of analysis. Moreover, within specific forms of indigenous architecture the column in the centre of the house also has the meaning of the axis of the world. It fulfils a '**symbolic**' function, which is important for a complete understanding of architectural design and is also the concern of this thesis for opening opportunities for users' participation in design process.

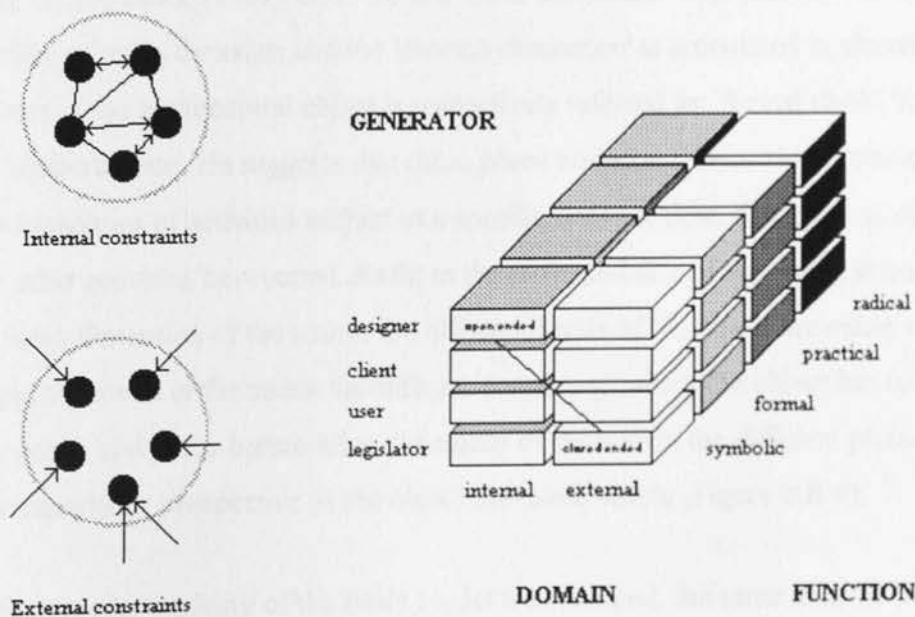


Figure 2.B.3 A three dimensional model for the function of design constraints
[derived from Lawson (1980)]
Source: the author

In the diagram above, Lawson (1980) classifies the domains into two parts: external and internal constraints. The internal constraints are imposed by the relationships wanted between parts of the object or system being designed. External constraints are imposed when a relationship is desired with something which exists outside the object or system being designed. He claims that for the fashion designer external constraints range from the manufacturing process, whether it is handmade or mass produced, to the human body itself. It seems that the balance of internal and external constraints in a design problem is of considerable significance in determining the nature of that problem and the designer's response to it. Hillier (1972) have proposed four functional model: **modifying climate, behaviour, resources and culture**, to help organized research in architecture. Markus (1969) provides another example which uses also a four-functional model and sees the function of buildings as divided between: **the building system of physical components, the environmental system, the activity/behaviour system and finally the organisational system which builds the houses**. Lawson, proposing the more general model, has adopted four functions: formal, symbolic, radical and practical which are illustrated in Figure 2.B.3.

According to the Bax's (1989) citation, the 'form-dimension' is articulated in levels, the 'function-dimension' in domains, and the 'process-dimension' is articulated in phases. To the various states of the architectural object is respectively referred as: 'formal state', 'functional state' and 'temporal state'. He suggests that these phase bound activities are in contrast to the other two categories of activities subject to a specific order of time. The process cannot, as in the two other activities, be reversed. As far as the state modality of the model is concerned, in the up-down dimension of the matrix the different levels of the object are made visible; in the left-right dimension of the matrix the different domains to which the object has to respond are made visible and in the before-after dimension of the matrix the different phases on the time scale experience prospective of the object are made visible (Figure 2.B.4).

As far as the process modality of the Bax's model is concerned, the same form of the matrix is used; in the up-down dimension of the matrix processes are made visible which tune the form of the object to forms on higher and lower levels; in the left-right dimension processes are made visible to fit the form of the object to the functions of the different domains; in the

before-after dimension of the matrix processes are made visible which tune the form/function combination of the object to demands generated in the past and yet to come phases of the procedure (Ibid.). 'Ordinance', 'integration' and 'development' processes are the names which are suggested by the same source for these different types of processes. These processes and states constitute the design fields for architectural design. These processes are composed from activities which are dependant on the modality of the model and have names according to the processes (**ordinance, integration and development**) and the states (**level, domain and phase**) which they transform (see Figure 2.B.4 and also Section (j) in Appendix One which is about Design Process).

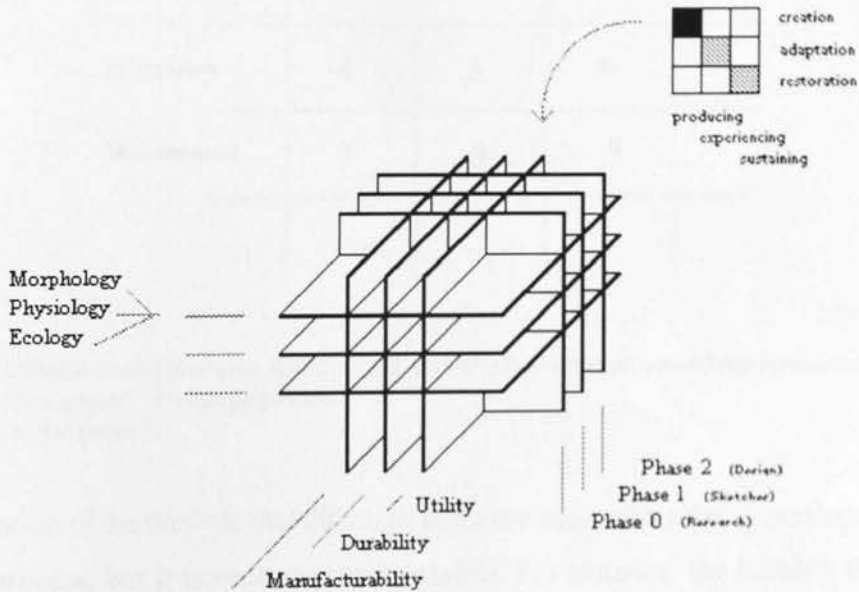


Figure 2.B.4 Three dimensional model of interaction between levels, domains and phases
Source: the author

Here, the thesis's concern is that these processes themselves pass always in a cyclic order: the modes of **analysis, synthesis and evaluation**. As a consequence of this observation, it makes sense to distinguish activities not only by their direction (in the matrix) but also by the modes in which the process works. This means that a classification of 3×3 types of activities seems a workable hypothesis for the analysis and conception of design process shown in Table 2.B.1. The author would like to argue that these activities are the basic part of the 'natural processes'

and new processes which have to be designed. In the latter case, the stand point which makes participation possible, to involve as much knowledge and creativity as possible, is that such models cover the instrumental functions of the design process which is necessary but not sufficient for satisfying people's real needs. The outcomes of the design processes are not the ends for the users but it might be for the designers. Therefore, procedures, to achieve such a goal, do not exist as such; they have to be designed.

	Analysis	Synthesis	Evaluation
Ordinance	1	2	3
Integration	4	5	6
Development	7	8	9

Table 2.B.1 Different modes (analysis, synthesis and evaluation) of different procedures (ordinance, integration and development) of a design process
Source: the author

Another concern of the thesis is that although there are many obstacles in participating users in design process, but it is necessary and possible. For instance, the London Borough of Camden representative, in Working Paper No. 95, indicated some problems facing Community Architecture groups, which may be similar to the same problems facing others. He said that tenant representatives, housing management, pressure groups, etc., are brought in to talk about schemes as they are designing, and then the feedback from that was fed into the design brief. He said: "Groups tend to be between 30 and 40 people, very unwieldy, when you have got six or seven schemes to present over 3 to 4 hours. There is a problem of diverse groups with conflicting interests. It is those who are most insistent in their effort, and turn up most regularly, who get their views eventually through to the design brief. There is nobody there to say we will give this section of the community more say."

According to the classification in Table 2.B.1 (see Figure 6 in Introduction and Figure 2.B.4 in this section), users can participate in three stages of design process: first, in the level of 'identification' (phase 0) for helping architects to understand and analyse the problems. Second, in the level of 'definition' (phase one) where the architects' initial idea emerges from the synthesis of the solutions and people encourage them for more check by asking question for appropriateness. This will lead architects to increase the understanding of the subject. Finally, in the level of 'specification' (phase two) where users can evaluate the modified new developed idea until the appropriate design is fully understood. Apparently, this kind of participation is accomplished by deductive reasoning and starts from ordinance and leads to development of designs (i.e. from 1 to 9 in Table 2.B.1). The inductive and abductive reasoning will provide other kinds of participation which will be examined in Chapter Four.

Summary and Further Discussion

This section, as the second section of Chapter Two (2.B), is conducted to focus on design as a tool for carrying out different development objectives in different ways. As it was reviewed, it is a critical discourse of design in a general sense, as a main tool to help implementing the development programmes for intentional changes in the built environment and pursues mutual purposes. First, it is an investigation of the effect of the designs' outcomes and their effectiveness in a synchronous dimension of research which seeks mostly the relationship between users and producers via products, as medias between them. This has been made while the concern was about supply-demand paradigm, which will be discussed analytically in Chapter Four: The Model (4.B). The role of design in society was addressed in a broader sense, concerning all the design fields, to elaborate the real design problems. 'Green Design' and 'Design for the Real World', which have been presented in Appendix One: Section (h), opened out some new approaches to solve design's problems.

Secondly, an analytic approach was adopted in a diachronous dimension from a structuralism point of view to pursue the causal relationship in the design process for answering the question 'How will a good design be possible? Here, the main focus was on people's participation in design process to bridge the gap between the interests of people and the products of the built environment professions, particularly with respect to social problems,

technical failures and aesthetic controversy; finding ways to respond to public dissatisfaction with Modern Design, for example, with Modern Architecture and Modern architects. Modern Architecture is considered to have failed in adequately considering the needs and ideas of building occupants and users. It is referred to by many commentators that architects cannot be trusted to respond to the users' interests unless they involve them.

It was reviewed that Western Society is undergoing profound social changes as it shifts from being an Industrial to being a Post-Industrial Society, or from a Modernist to Post-Modernist Society, with all that this means in terms of such things as the changing role of leisure in relation to work. An emphasis on the quality of life is, for the prosperous inhabitants of the West, replacing an emphasis on quantity. This not only applies to personal ownership in a time of relative abundance but, for examples, to technological matters, where the obsession with making a machine which is faster or bigger is being questioned by those who believe that the machine should be more socially and environmentally useful and responsible.

The Industrial Revolution not only helped redefine the human subject as a direct producer or as an assistant to the process of mass production, it also remade us as mass consumers; firstly for money itself and then for all of the commodities like cars, fridges, and cookers that help define modern life. This is a process that is achieving new heights with the profusion of the stores where people buy the products of industrialised production, and thereby mass produce the spaces of their home lives. Such familiar changes have been accompanied by perhaps the most important contemporary innovations of all, which are those connected with mass communication and information systems. Here, people have the television, the radio, the video, the Personal Computer, the Satellite, along with the whole arsenal at the disposal of modern publishing and advertising corporations. The massive increase in the production of information as a commodity, and of pleasure devices in the form of new technologies are all part of the armoury and fabric of industrial society. Indeed, their proliferation is wholly dependent on the industrialisation of production. It would be easy to see such improvements in the quality of life brought by the consumer and communication revolutions as technologies are able to develop in an autonomous way beyond the limitations set by political and economic interest groups (Charley, 1994).

'Quality of life' is not, of course, synonymous with 'standard of living' and it is the confusion of these as criteria that follows so much contemporary political and social debate. The shift might be about a transition from quantity to quality, but commentators are still employing criteria that are attached to the old condition. For example, it was reviewed that in the 1980s, in the West, there was much talk about the quality of life, but the concept of 'quality' was frequently selfishly defined. **In the 1990s words like 'integrity' and 'honesty' may be worth little more than the adverts in which they are so often contained, but they are at least symptoms of a concern to redress the balance of society in favour of more public values.**

Inevitably, when one is addressing such an issue one is engaging in a debate about values and it is not only healthy but crucial that values are discussed explicitly rather than implicitly. This has not happened nearly enough in the design profession or design press. Values must be translated into standards and criteria, and inevitably lead back to the fundamental question 'What is good design?' Values imply a commitment not only to the designer-notions of 'integrity' and 'honesty', but also to societal notions of 'equality' and 'justice'.

It has always been a limiting view to think of design as a straightforward problem-solving activity. The literature indicates that products are not bought just to fulfill primary functions or use-value. They are also bought to confirm status, confer prestige and, in a general sense, to satisfy longing. It might be argued that many products are not intrinsically stereotyped. This is true but, in a consumerist society, it is not possible neatly to separate out a product's function from its image, or its **use-value** (accomplished by production process) from its **exchange-value** (accomplished by supply-demand relationship). Unless a person has somehow contrived to cocoon himself from the media and advertising, when s/he buys a product s/he is consuming a total mix of the product and its meaning.

The author would like to suggest that design directly expresses the cultural, social, political and economic complexion of a society, and it thus provides a snapshot of that society's condition. In so doing, it reveals a great deal about a society's priorities and values. Design matters: it is too important just to celebrate, collect or historicize. The world situation demands that there is a need for developing a greater awareness of design's values and their

implications, and exercising a greater control of design in our societies. One objective should be to build as much flexibility as is reasonably possible into a design at the beginning in order to assist incremental improvements by user's participation throughout its life.

In addition, the concern of the thesis is about this fact that Green Design does not present designers with any easy answers. As always, it is up to the individual designer or design team to find out the facts and make sensible judgements, having weighed up the overall benefits of different alternatives. It is reviewed that the Green movement is like the Left in so much as it is united in its vision of the ideal political organization of society. Thus, talking about Green Design as if it is some fixed set of principles or consistent methodology is misleading. Green Design ultimately has to be defined in relation to the particular complexion of Green Politics.

It is said that for radical Anarcho-Greens, Green Design is activist and participatory, with complete reuse and recycling replacing the use of any 'new' materials. Buddha-Greens see no need for any but the most basic objects, and preach a simple and meditative way of living without possessions. For these groups, consuming is itself a symptom of a decadent civilization. But, while our cultural and social habits of consuming still predominate, one of the key questions is bound to be, how so people consume more responsibly? In Porritt's (1984, pp. 195-6) words: "The problem for the future is to ensure that the interests of the individual are more in line with those of society at large and with those of the planet." In other words, an emphasis on treating the symptoms of a problem glosses over what may be its social and cultural causes. By presuming that the change has to be with the effect rather than the cause, the design 'solution' can be seen to be accepting the status quo.

The author's concern is with the fact that if discussion is contained within the conventional design discourse, it will miss the point. **People need to gain knowledge of the means to effect the decisions that control their material and social environment.** Then designers would be better able to serve them, rather than perpetuating the power imbalances. This may also require a political change. Design in its broadest sense, Martin (1985) says, is power, control and defining new possibilities to aim for. So, there is a need for criticising design from a position of knowledge, as users and as practitioners and to initiate new possibilities.

It was also reviewed that all technology has a directly political character, in the way in which it is designed, in the purposes to which it is put, and in the role which it plays in the depiction of a technological utopia. There remains the implication drawn from this, that under different social relations, the productive forces, including the character and content of technology is to replace the critique of the metaphysics of the capitalist machine with a new metaphysics that is equally utopian and problematic. It is possible, however, to talk of qualitatively new types of technology and machinery that liberate the subject from heavy work but enable the people to contribute creatively to the production process, that restore or rather create the conditions by which people can gain control over the whole process of conception and execution. Forms of technology where the speed and organisational features of the work can be regulated directly by people. Forms of technology that are socially useful rather than destructive, life enhancing rather than life threatening. This suggests aspirations that go beyond the job enrichment programmes that have come with the transition to what has been called by Palloix (1978) 'Neo-Fordism'. It implies and is indeed predicated on the wholesale transformation of social relations inside and beyond the work place.

HYPOTHESIS
AND MODEL

PART TWO

HYPOTHESIS AND MODEL

INTRODUCTION TO PART TWO

This Part consists of two chapters which relate to the development of the model of endogenous development theory. The new discourse's roots lie in Part One. There is a direct interaction between the knowledge and information contained in both Parts. The principles and paradigms identified and developed in Part One, through a process involving an examination of the constituent parts, are reconceptualised and reordered into a model. The process of this Part is basically a different approach to the same problem, seeing the problem from a different context and is the development of a relative structure for those parts. In Part One, we found raw data. In Part Two, seeing the structure and relationship between elements of the data allows us to conceptualise, reconceptualise and to simulate. This is the process of abduction, the synthesis or resynthesis of the elements discovered in Part One, using new tools brought from scientific, logical and philosophical world views.

If, for example, we intend to work with people's participation but without an understanding of cultural identity, which might be explored by the homeostasis of system view or the homeorhesis of structuralism, we are doomed to fail in the implementation of the model. Equally, development is discussed from different viewpoints in each part. Part One discusses development in a more descriptive and practical way, while Part Two talks about the principles of change and development from a more conceptual angle. Literature talks of the development of a better future, and wants to include people. This change should have a mechanism. The mechanism of change in society, it is argued, lies in the interpretation of living systems. Because of the world view of structuralism and system approach, we may find some principles to help conceptualise our preferences and avoid many problems of practice.

Therefore while Parts One and Three are based on the ground and are concrete, it could be claimed that Part Two is based on a conceptual level. It develops a principle which has a meaning in a new context. The argument is about the principle itself. It is conceptual and at this stage has less relation to implementation than to the world view and philosophy of the model. This should be recognisable as the point at which most people begin to build theory.

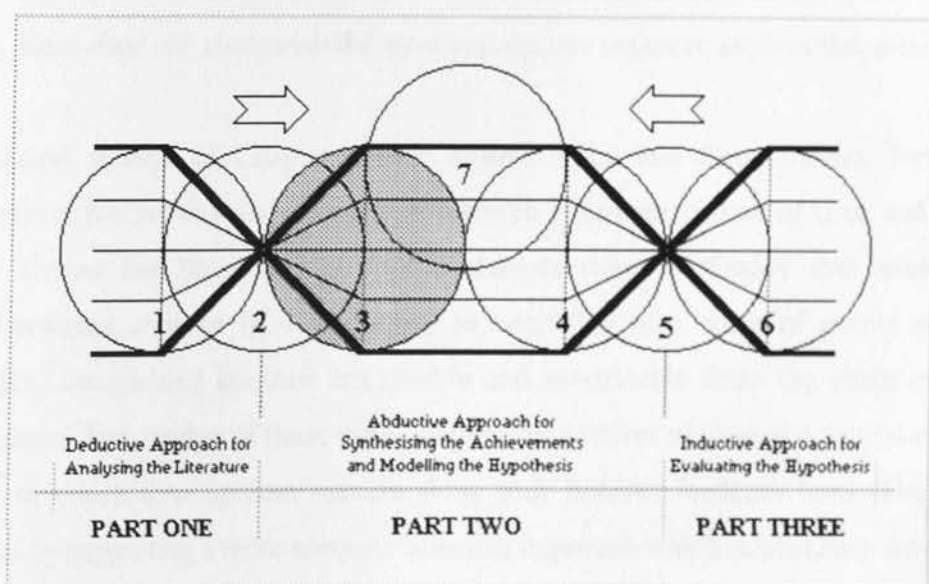
The thesis tries to stand, therefore, between literature and case studies, and between the present and the future, between realised and conceptual. These methods were adopted because they accord with views that are evident and developed out of the author's professional life on the ground experience.

The first chapter of this part, i.e. Chapter Three, is an aid to the building of the structure, on a scientific level. The seeking of a solution begins with science and technology, two available tools for the realising of the model as a solution to our problems. It looks to the relationships between the principles and paradigms drawn from the data taken from Part One and is based on general system theory and structuralism.

Chapter Four is the introduction of the model itself. The chapter begins with a brief description of modelling. The author decided to use an illustrative, geometric, three dimensional model in order to show endogenous development theory, rather than a mathematical or metaphorical model. This provides a comprehensive view, allowing for the building in of very specific elements. Chapter Four ends with a partial conclusion which sums up the ideas and processes to date. In Part Three, there is a further grounding for the model, based on case studies to test the model.

CHAPTER THREE

DEDUCTIVE ANALYSIS



INTRODUCTION TO CHAPTER THREE

In Part One, we collected and refined the intellectual resources needed for discourse. However, resources in their crude form are not ready to respond to real-life situations. To give them function, they must be mediated with their possibilities, synthesised and resynthesised into a practical, analytical tool. In order to do this, the nature of the author's discussion must enter a conceptual level where resources can be imaginatively manipulated. Chapter Three: Deductive Analysis, is the point at which the research can metamorphose into a theory, which will lend itself to implementation, and has two sections. The methodologies of research will continue to be descriptive and explanatory in order to lead to Chapter Four, which uses an entirely simulative method to forge the criteria for evaluating survey data.

The first section, General Theoretical Framework of Attitudes, considers existing methods of research analysis and serves as a gateway to the whole discussion of data manipulation that is Part Two of this thesis. There are several mechanisms of idea manipulation, ranging from positivism to romanticism, deductive to inductive. Some are less appropriate by being predicated on certainties which are too inflexible and dictated by a notion of linear time to explain the role of development in society. By exploring a range of accepted theoretical models, the author can customise the most appropriate means to express this thesis.

The second section of Chapter Three: System View and Structuralism, furthers the exploration of the shortcomings of scientific research in its appreciation of 'time' and 'change'. System Theory and Structuralism dispute absolute views of 'finality' that construct the monodirectional concept of development as consisting of a chain of events which are irrevocably determined by their irreversible and inextricable from the chain of cosmic consequences. But, neither of these views address the concept of time as a natural and cyclic context in which development operate along truly holistic, feedback lines. The Chapter concludes by supporting a more adequate scientific approach which refutes such determinism for the real values of people, which cannot be explained through simple logical certainty, and it is these values that form and motivate the intentional process of development.

3.A

GENERAL THEORETICAL FRAMEWORK OF ATTITUDES

Introduction to General Theoretical Framework of Attitudes

3.A.1. **Deductive Analysis and Reductionism**

3.A.2. **Inductive Synthesis and Expansionism**

3.A.2.1. Transactional Thought

3.A.3. **Time and Change in Transformation**

3.A.3.1. Synchronous and Diachronous Dimensions

3.A.4. **Theory and Law in Science**

3.A.4.1. Scientific Verification

Conclusion of General Theoretical Framework of Attitudes

Introduction to General Theoretical Framework of Attitudes

A deductive analysis was conducted in Part One to overview briefly the ways in which professionals usually develop their subject's matter. The aim of Part Two, which is the focus of the thesis, is to make a hypothetical model of endogenous development concept. This section, as an introductory to Chapter Three, is a manifestation of an attempt to open out a discourse about a general framework of scientific attitudes to be able to trace the roots of endogenous development theory out of the debates of system theory and structuralism. This chapter mediates between actual and experimental achievements and the hypothetical theory and facilitates the next chapter for preparing an appropriate abstract model.

There has been a gradually growing recognition that new methods constitute a new direction for operational research and environmental analysis. Do these methods have, despite their diversity, an underlying unity? The analytical work of the discourse in defining the meaning of development shows that variety of attitudes, theories and practices with their applications in the surface, have coherent deep structure of meaning underneath. This section, therefore, may help us to achieve better understanding and facilitate identification of some factors that can encourage acceptability of a new approach for gaining this meaning. Ackoff (1974) says that scientific method in environmental analysis and design is not able to deal with problems in their living complexity. But, it seems that the main theme in science is still the theoretical characterisation of complexity and organisation in phenomena. **A series of fundamental concepts, including 'gestalt', 'system', 'fields', 'cybernetics', 'communication', and 'structure', refer to the gradual unfolding of the 'science of organisation'.** Most of these concepts have been canvassed from time to time in the environmental field as proper theoretical tools for research and are briefly discussed in the following text (Ibid.).

3.A.1. Deductive Analysis and Reductionism

It was pointed out in 'Identification of the Problems' that the selection of problems for solution and the way one formulates them depends more on a person's philosophy and world view and that the way of solving them depends on a person's available science and technology. The ability to use this science and technology also depends on a person's philosophy and world view. These, in turn, depend on the concepts and ideas s/he uses and how s/he uses them to

organize her/his perception of the world.

In the Machine Age (which produced the Industrial Revolution) ways of thinking were 'analytical' and based on doctrines of 'reductionism' and 'mechanism' [see Chapter One: Problem Identification (1.A)]. Reductionism has been described as a doctrine which maintains that all objects and events with their properties and one's experience and knowledge of them are made up of ultimate elements, indivisible parts. For examples, the physical sciences during the Machine Age maintained that everything was ultimately made up of indivisible particles of matter called 'atoms'. **Atoms were taken to possess energy, and energy was conceived as the power of doing work. Work, in turn, was defined as the production of an effect on matter:** for example moving or transforming it (Ackoff, 1974). Later, the same source modifies the scientific view of considering the reality in page 9 and claims:

"Chemists reduced the different kinds of matter to different kinds of 'elementary substances'. Biologists accepted the 'cell' as the ultimate element of life. Leibnitz (1646-1716) ... postulated the existence of psychic elements, 'monads'. John Locke (1632-1704) ... argued for the existence of ultimately simple elements of experience and knowledge, 'simple ideas'. Much later Sigmund Freud ... reduced personality to the interaction between three ultimate elements: the 'id', 'ego', and 'superego'. ... he and most psychologists postulated the existence of such indivisible elements of psychic energy as instincts, drives, and needs."

Ray (1989) writes about three general stages in the evolution of scientific thinking and indicates that several authoritative historical analyses agreed by Dewey et al. (1949), Einstein et al. (1938), Handy et al. (1973), and Kantor (1946, 1969). They can be classified:

1. thinkers who assumed that natural events acted under 'self-contained powers'; [As noted by Dewey et al. (1949, p. 110), to the time of Galileo the learned view was "that there exist things which completely, inherently, and hence necessarily, possess Being, that these continue eternally in action (movement) under their own power continue, indeed in some particular action essential to them in which they are engaged."] and

2. theorists who invoked various substances with unique, inherent properties to account for heat (caloric), combustion (phlogiston), light (the ether), biological functioning (vital force, entelechy), and human psychological behaviour (soul, mind) (Ray, 1989). [Thus, the same source claims, this initial stage is referred to as 'substance theory' by Einstein et al., (1938), as 'substance-property stage' by Kantor (1946, 1969) and as 'self-actional stage' by Dewey et al., (1949).]

Ackoff (1974) indicates that ultimate reality was limited to physical aspects. Therefore, in each branch of science, the main concept was based on physics. Physics was considered to be the basic experiential of chemistry, chemistry of biology, biology of psychology, and psychology of social sciences. Nature was believed to be organized hierarchically in the same way as the one-directional ranking of ultimate elements in sciences.

Analytical thinking explained an automobile's behaviour by identifying its parts and explaining the behaviour of each part and the relationships between them. It was also considered as a centre of problem solving. The problem of running a city, for example, was broken down into running transportation, housing, health, education, police, and so on. Analytical thinkers believed that if each of these functions were managed properly, then the city as a whole would be run properly (see discussion about Problem Identification: 1.A).

3.A.2. Inductive Synthesis and Expansionism

In the Systems Age (which produced Postindustrial Revolution) everything tended to be looked at as a part of larger wholes rather than as wholes to be taken apart (Ackoff, 1974). This is the doctrine of 'expansionism'. **Expansionism brings the 'synthetic' mode of thought much as reductionism brought the 'analytic' mode.** In analysis, the whole is explained by explaining its parts but in synthetic mode of thought, something which is explained, is viewed as a part of larger system and its role in that larger system is important. For example, by synthetic view universities are explained in terms of their role in the educational system of which they are part, rather than by the behaviour of colleges and departments of which are their parts.

In synthetic thinking, both individual and collective human behaviour can be explained, which is not possible to do by analysis alone. Those who believe in synthetic mode of thought, seem to be more interested in putting things together than in taking them apart. Of course, this should be under a logical consideration. It was also reviewed, in the Problem Identification Section, that the application of the synthetic mode of thought to systems of problems is called the 'system approach'. This approach is based on the observation that the sum of the criteria applied to performance of the parts of a system is seldom equal to the criteria applied to that of the whole. For example, it is not possible to assemble different available parts from different types of automobile into an automobile. They would not work together well even if the parts could be assembled. This is the same for an all-star football team which is seldom as good as the best team from which the players are drawn. In fact, system performance depends critically on how well the parts fit and work together, not merely on how well each performs when considered independently.

3.A.2.1. Transactional Thought

Having different methods (analytical or synthetical), a researcher should be also concerned about the relations/transactions between the elements and components of a system. There are differences between relational and transactional entities in psychology generally and in environmental psychology more specifically. To give a brief characterization of transactional thought in these fields, Hartig (1993) refers to Altman et al. (1987) and says that to distinguish what they call 'transactionalism' from the dominant 'interactionalism' the differences noted are in units of analysis, treatments of the temporal dimensions of person-environment systems, and conceptualizations of change.

Describing the 'interactional approach', Hartig (1993) emphasises the fact that it has divided person-environment systems into discrete entities with particular properties. He says that the focus of this kind of analysis is on the independent and interactive effects that psychological and situational factors have on functioning. This view sees temporal factors as distinct variables and time as a means of locating phenomena, a backdrop against which the interplay of personal and situational variables unfolds. Therefore, change results from the interaction of personal and situational variables and is known from differences in measures of those

variables taken at different time points. Then, he claims that desired research outcomes of interactional approach are general principles that can be used to explain antecedent-consequent relationships within a set of specific variables.

A 'transactional approach' is taken to be an approach whose unit of analysis is the holistic entity or event, a convergence in time and space of people, activities, and setting (Altman et al., 1987). Hartig (1993) follows the discussion by stating that in this approach person-environment systems are not divided into discrete elements or relationships, but are formed of and defined by the simultaneous and combined action of their aspects. In his view although aspects such as individuals and contexts may be studied separately, they are in reality inseparable; they, Altman et al. (1987, p. 24) claim, "jointly define one another and contribute to the meaning and nature of a holistic event." Time and change are aspects of systems, as integral to phenomena as the person and their physical and social contexts. Change is, thus, intrinsic to the event rather than an outcome of the interaction of separate elements. Efforts are directed toward understanding the changing phenomena.

Unlike Altman et al. (1987), who consider several phenomenological studies for transactional research in environmental psychology, and Seamon's (1982) review of the phenomenological contribution to environmental psychology indicates that transactional and phenomenological approaches can also differ. For example, the former are not limited to qualitative 'description'¹ of a given phenomenon as experienced by an observer. Also, transactional approaches can apply existing 'explanatory' principles in trying to account for a holistic event (Hartig, 1993). Therefore, a fundamental postulate of a transactional perspective is the essential unity of organism and environment. Ittelson (1973, p. 18) in this relation asserts:

"Never concretely encountered independent of the situation through which he acts, nor is the environment ever encountered independent of the encountering individual. It is meaningless to speak of either as existing apart from the situation in which it is encountered. The word 'transaction' has been used to label such a situation, for the

¹ See Chapter Six, Questionnaire to find more details about Chapin's (1974) definition of 'description', 'explanation', 'simulation' and 'evaluation'.

word carries a double implication: one, all parts of the situation enter into it as active participants; and two, these parts owe their very existence as encountered in a situation to such active participation - They do not appear as already existing entities which merely interact with each other without affecting their own identity."

3.A.3. Time and Change in Transformation

Time and change are important dimensions in the study of any artificial domain². It is through transformation that variety is to be explained. The stability of any system whether natural or artificial, including the ability to generate change, is in space-time, not in three dimensions synchronous space, i.e. in the surface structure of that system. Answering the question of how the structure of the past has produced the structure of the present, requires a diachronous methodology in the deep structure of a system. It must be emphasised that this approach is still in the early stages of development and has been discussed here only to illustrate the possibility of transformational approaches.

On a sociocultural level, changes in institutions, technologies, attitudes, and behaviours may emerge over many generations or within a single generation. On the individual level, change may accompany particular life events and also fall within predictable developmental and life-cycle stages. Because change tends to unfold at a different pace on each individual level, exchange across levels of aggregation ends to proceed at differing rates. At a given point in time, people carrying the transaction may, whether or not they are conscious of their role in the process, experience tensions arising from discrepant biological, sociocultural, and individual standards for behaviour (Bourassa, 1990). Guiding the process of built environmental change in urban and rural areas will also require knowledge of the processes, both natural and social, which shape the built environment over time, as well as 'appreciation of the different professions as dynamic and evolving' (Spirn, 1986).

For analysing the transformational approaches, it may be pointed out that 'deep structure' and 'transformation rules' of abstract systems, 'generate' their 'surface structure'. The 'deep

² One of the four categories of Man-environment relationships: Sciences of Man; Sciences of External Nature; Man-environment Paradigm; and Science of Artificial (Hillier et al., 1972-73).

structure' concept is equally either a value, for the author, or a theory, for Hillier et al. (1972-73), to be related deductively to 'observable' in normal scientific fashion³. This general relationships between structure, transformation rule, and observable form have been found in various branches of logic, mathematics and the other abstract systems.

3.A.3.1. Synchronous and Diachronous Dimensions

To know more about the research methodology in different branches of science, it is worth adding that there are two principal explanatory strategies in human sciences. One is in the synchronic plane, where the aim is usually to produce 'typologies' by statistical analysis of the distribution of variables and the other is in the diachronous plane, to identify 'causal' relations usually by experiment or multivariate analysis. These correspond to the structural sciences strategies that are concerned to 'generate' synchronous variety which may be distinguished conceptually from those concerned to 'generate' diachronous sequences (syntax being a time order, as in cognitive development). In sociology, the synchronous dimension is associated with 'description' and the diachronous dimension with 'theory' (Hillier et al., 1972-73).

The thesis uses the synthetic mode of thought for developing a new theory by the synthesis of several earlier theories to identify the emerging point of the problems holistically (i.e. abduction inference). Then, an analytic approach has been conducted to simulate a model for solving them (i.e. deduction inference). Whatever is produced in this way is a new method that is a synthesis of the best features of the old methods. The thesis suggests a diachronic mode of thought to trace interaction between objects, events, and their properties chronologically beside having a synchronous view of the world to define their relationship systemically.

Analysing the subject and finding its theoretical frame work, an 'epistemological model of models', quoted from Hillier et al. (1972-73), has been also a matter of concern, which distinguishes models on two dimensions: the 'internal-external' dichotomy, and the 'direct-action-symbolic mediation' dichotomy (Table, 3.A.1). They claim that all four types of this

³ According to the Endogenous Development Model, values are located in the first stage of the Production Process Paradigm, i.e. Ultimate Cause and theories are placed in the second stage of this process, i.e. Subjective Cause. The third and Forth stages are Objective Cause-effect and Formal Cause-effect which will be explained later in Chapter Four.

proposal have a legitimate domain in environmental science; to mistake them for each other will lead to the suppression of an environmental theoretical science and it will lead to a new scientific instrumentalism which creates the universe according to its prediction.

		Internally Structured Theoretical Model	Externally, Intentionally Structured Model
		Self-Regulation	External Control
Symbolic, Programme Mediate Model	Symbolic, Mediate Model	The System as It Represents Itself to Itself Semiology Genetics Structural Model Mathematic, Linguistic, Logic	The System as It Appears for the Modeller's Purposes of Resolution Instrumental Sybernetics
Direct Interaction Model	Functional Model	Eco-Systems Self-Regulating Machines Natural Cycles Analytic Cybernetics The System as It Actually Functions	General System Models Statistical Models The System as It Functions for the Modeller's Purposes and Level of Resolution

Table 3.A.1 Epistemological Model of Models

The table is derived from Hillier et al. (1972-73) and is modified by the author in this way to illustrate the relationships of its components conclusively.

Source: the author

According to the Epistemological Model, General System Models are externally and intentionally structured and function directly according to the modeller's purposes and level of resolution. They are also externally controlled. On the contrary, the Structural Models are theoretical, symbolic, and programme mediate models which are internally structured. In this position, system represents itself to itself and has self-regulation. Mathematics, linguistics and logic are good examples of these kinds of model. Explaining goal-seeking, purposeful, and alive systems, it is possible to use direct interaction models which involve ecosystems, self-regulating machines, natural cycles, and analytic cybernetics. They are internally structured

and theoretical models which are self-regulating systems as they actually function.

It is almost possible to classify the Endogenous Development model according to the epistemological classification. This model may be placed between symbolic programmed mediate models and direct interaction models, i.e. between structural models and ecosystems. The Endogenous Development model is, therefore, self-regulation, functional, and symbolic programme mediate model which concerns the function of 'production process' in building the environment. It also qualifies the attitudes and purposes needed for the process by knowledge and the experience embodied in the process. A feedback control will help achieving this goal by evaluating and comparing the outcomes of the process with the other products which are interconnected by supply-demand paradigm. This experimental and empirical knowledge will also help in improving the creativity as the main resources for the process. Therefore, the suggested area in Epistemological Model is rather helpful for the model of endogenous development which is about development of purposeful systems [see the main discussion about 'production process' and 'supply-demand' paradigms in Chapter Four: The Model (4 B)].

Transformation needs time and through the process of transformation the properties of a system will be changed. Each system has two structures, one is in surface, its performance, which can be identified by a synchronous mode of thought and the other is in depth which can be identified by a diachronic mode of thought. Some kinds of systems are regulating, transforming, invisible invariance, and non-observably structured. For instance, the relational systems (e.g. language, cities, symbolic systems, etc.); structural models (e.g. mathematics, linguistics, logic); purposeful systems; and alive systems are among them (Figure 3.A.1).

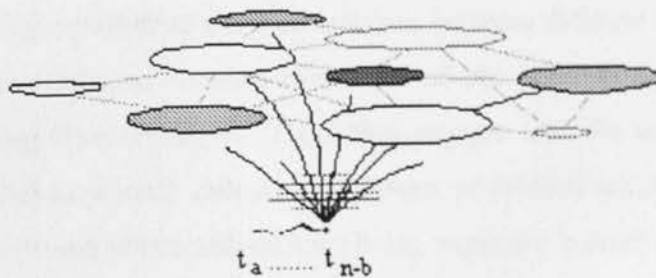


Figure 3.A.1 Diachronic relationship of components in a system
Source: the author

In the discussion about the differences between system theory and the structuralism in the next section (3.B), the argument will point to the fact that the concept of an internally generated 'structural stability' is comparable, and may be contrasted, to the 'homeostasis' of system theory. In system view, relationships between components which are externally and intentionally structured and have direct function, are under consideration. These components can be objective or subjective, visible or invisible and their relationships can be visible or invisible as well. A system's performance depends on how it relates to its environment - the larger system of which it is part - and to the other systems in that environment. For example, an automobile's performance depends on the roads over which it is driven and on the presence and driving of other automobiles on those roads. Therefore, the attempt must be to evaluate the performance of a system as a part of the larger system that contains it (Figure 3.A.2).

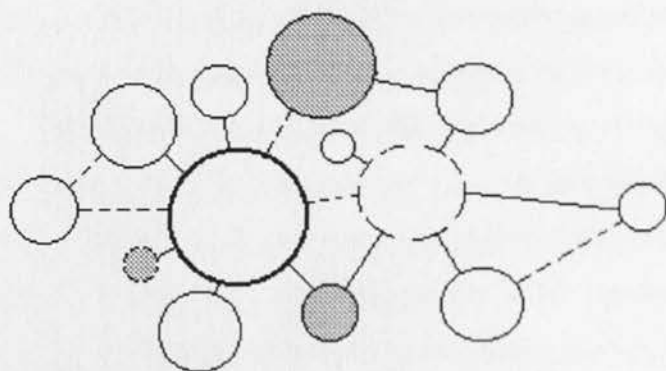


Figure 3.A.2 Synchronic relationship of components in a system

Source: the author

In sociology the synchronous dimension is associated with 'description' and the diachronous dimension with 'theory' (Hillier et al., 1972-73). The same source claims that a transformation approach rewrites both dimensions at a fundamental level, locating both at the level of theory, and using the notion of 'generation' to show connections between different observable forms and 'evolution' to show relation between two states of one invisible concept to explain connections concerning time sequences. Thus, they suggest that the whole question of 'causality' in its naïve form is made redundant in favour of relation which are pervasively 'generative/evolutionary' and connected without being explicitly 'causal' at every level of resolution. In this regard, they also claim that there is no more to say than that no event is arbitrary. But, the concern of the thesis is that all the human activities are intentional and

purposeful in artificial domain and should respond to the users' needs or wants. Therefore, there is a need for investigating the usefulness of the products by evaluating the procedure of problem solving and design and tracing their start points which can be explored as if they are ultimate causes of the processes.

3.A.4. Theory and Law in Science

Hillier's et al. (1972-73) pinpoint the fact that good scientific theories usually generate debased version which are applied in theoretically weak fields. Reviewing versions which had been applied in different fields, they claim that Galilean physics led to scientism; relativity in physics led to philosophical relativism; and evolution theory was generalised as the 'competitive struggle for existence' - the paradigm of capitalist economics; scientific structuralism generated a new universal language for the presentation of trivial arguments. The same source adds, in each mentioned cases, that the theory became the opposite of what it was. For example, Galilean physics excluded the non-measurable properties from physics; scientism measured them. Relativity theory was to save the invariance of physical laws; philosophy made it all depend on the observer's view. Evolution theory located order deep in time and transformation; Social Darwinism relocated it in the synchronous balance of competitive forces. Structuralism proposed a deep abstract formation as the basis of richness and variety; its applications returned structure to the surface level, thereby losing variety and searching for a superficial sameness. Thus, the richness and explanatory power of modern theories of natural form owe much to the transformational dimension rather than simply time.

Giving an implicit definition about theory, Thorne (1972, p.179) cites from Kuhn and writes that: "In his book 'The Structure of Scientific Revolutions', Kuhn has argued that the tradition view of the history of science, that sciences develop through the gradual accumulation of data and the gradual extension of theories to cover the data, is quite false." He, then, pinpoints the Kuhn's citation which indicated that what, in nearly every case and in retrospect, appeared to be new and crucial data, far from being new, were available long before an accepted theory was rejected and only came to be seen as crucial in the context of the theory that took its place. By emphasising on the title of the book, he explains Kuhn's view of the history of science and claims that it is more about the fact that all significant developments are, in a quite

literal sense, revolutionary and that just as the concept of the state changes in political revolutions. So in the case of scientific revolution, the concept of the science - what scientists are prepared to accept as facts - changes; so that in an important sense it is no longer about what it used to be about.

3.A.4.1. Scientific Verification

Francis Bacon (1561-1626) defined the 'inductive' route to scientific explanation (Holt-Jensen, 1988). He argues that a scientist starts with a range of sense-perceptions that one works up conceptually and verbally into several loosely arranged concepts and descriptions that many researchers like to call facts. Next, certain definitions are necessary to organize the data. Afterwards, the facts are evaluated and arranged in relation to the definitions (Figure 3.A.3).

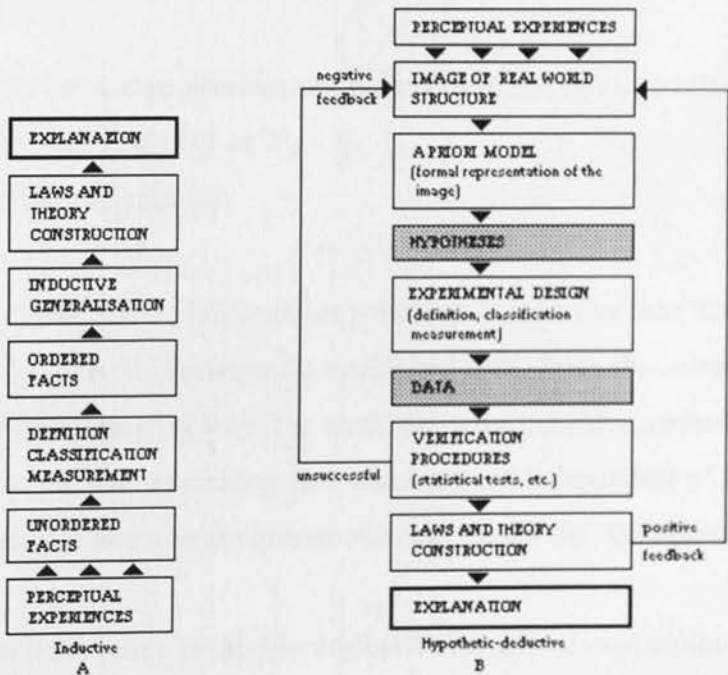


Figure 3.A.3 Inductive (Baconian) and hypothetic-deductive routes to scientific explanation
In the original model, derived from Harvey (1969), direction of relationships in column A is from top to bottom, i.e. the box 'experiences' is in the top and the box 'explanation' in the bottom.
Source: the author

The ordering and classification of data is often the chief activity of science in the early stages of its development. These first classifications may give only a weak explanatory function. Continuing study of the interaction between classes and groups of phenomena reveals a

number of regularities; such regularities and laws are called by Holt-Jensen (1988) 'inductive laws' since they are derived from the observations of a large number of single instances.

An attempt has been made by the same author to clarify what a 'scientific law' is. He quotes from Braithwaite (1953, p. 12) who defines a law as "a generalisation of unrestricted range in time and space", in other words, a generalization with universal validity. With this definition it is possible to distinguish between empirical generalizations and laws. An empirical generalization is said to be valid for a specific time and place but a law is universal. James (1972, p. 473) maintains that the only truly universal laws are those of physics and chemistry, although even in physics there are elements of uncertainty that make probability calculation necessary. Harvey (1969, p. 31) gives the concept of law a much wider significance and postulates a threefold hierarchy of scientific statements from:

- 'factual statements' or systematized descriptions, through a middle tier of
- 'empirical generalizations' or laws, to
- universal 'theoretical laws'.

A scientist hopes to be able to link together a number of inductive laws that will include the relationships and association between the established laws. From this material s/he hopes to formulate general and overriding laws. The weakness of the inductive method is said to be the processes of ordering and structuring data which are not independent of the theory that is ultimately constructed (see also the introduction of Chapter Six: Questionnaire).

Harvey (1969, p. 438) refers to the teleological framework of explanation and claims that: "this consideration is possible without a metaphysical assertion." **A 'teleological explanation' is generally taken to mean that a phenomenon is explained in relation to the purpose it is believed to serve. A mechanical or causal explanation, on the other hand, relies on pre-existing causes to explain the observed phenomenon.** A causal explanation is only reached when, for example, the law of nature that is the cause of certain empirically observed single instances have been found. **The inductive model is said to be associated with the teleological explanatory model and it will not really serve when the concern is to look**

for 'prime causes'⁴, that is, causes which are prior to and cause the phenomena that have been observed empirically (Ibid.).

The same source refers to Newton and says when he 'was hit on the head by a falling apple' he grasped the idea of a universal law of gravitation inductively. He could then set the law of gravitation up as an hypothesis but any confirmation of its universality could only come through the testing of a larger body of empirical material. It also indicates that the development of the natural sciences in the latter part of the nineteenth century provided the technical tools that made it possible to test hypotheses with some precision, by using a number of repeated experiments.

Inductive arguments were increasingly replaced by 'hypothetic-deductive' methods (Figure 3.A.3). According to the model, research workers, starting from an inductive ordering of their observations or from intuitive insights, tried to devise for themselves 'a priori' models of the structure of reality. These were used to postulate a set of hypotheses which could be confirmed, modified or rejected by testing empirical data through experiment. It was observed that a large number of confirmations were supposed to lead to the 'verification' of the hypothesis which was then, for the time being, established as a law. This law stood until the results of later research eventually rejected it. No proof of the absolute truth of a law can ever be produced as definite verification is virtually impossible (Ibid.).

Karl Popper has pointed out that the truth of a law does not depend on the number or times it is confirmed experimentally; it is easy enough to find empirical support for almost any theory. The criteria for its scientific validity are not the confirmatory evidence, but that those circumstances which may lead to the rejection of the theory are identified. **He claims that a theory is scientific if it is possible to 'falsify'.** Kuhn criticizes Popper for believing a theory will be abandoned as soon as evidence is found which does not fit the theory. Kuhn maintains that all theories will eventually be confronted with some data which do not fit. **A fundamental theory is not rejected if individual research data do not fit it, for if it were,**

⁴ The prime cause is similar to the ultimate cause which is the prime mover of the production process paradigm in the thesis [see Chapter Four: The model (4.A)].

then all theories would have to be rejected. According to Kuhn, a fundamental theory is only rejected when a new theory is put forward which is believed to be superior (Johansson, 1973). Holt-Jensen (1988) also confirms that the history of science does not record any theory which has not eventually been confronted by contradictory circumstances (or instances of falsification) so far.

Aquist (1981, p. 11) refers to Paul Feyerabend who adds that scientific development is much more 'irrational' than Popper's scheme of falsification allows. Alongside straightforward arguments, the proponents of new theories have also often used propaganda and psychological tricks. He says: "**Feyerabend does not believe that we would have had any science as we know it today if the principles of verification or falsification had been followed in every detail.**" The same source indicates that our world view would have still been geocentric if Galilei did not stick to his heliocentric world view, although he could not find empirical proofs which would falsify the geocentric view. Feyerabend supports the view that the development of scientific knowledge follows an irrational almost anarchic path, along which almost anything goes, as far as methodology is concerned.

Kuhn does not accept Feyerabend's views of the irrationalities of scientific progress. He denies intending to present scientific theories as intuitive and mystical; more appropriate for psychological analysis than for logical and methodological codification. On the contrary, Kuhn asserts that every scientist must gather as much rational proof in support of a new theory as possible and to be precise and honest in his work. This approach reflects the underlying values of science and scientific choice of theories rather than providing a blueprint as to how a scientific theory should be chosen and defended (Holt-Jensen, 1988).

Wiener (1964) in response to the Popper's idea of falsification in science claimed that: "If it is dangerous to assert an analogy on insufficient evidence, it is equally dangerous to reject one on insufficient evidence, it is equally dangerous to reject one without proof of its inconsequentialness. Intellectual honesty is not the same thing as the refusal to assume an intellectual risk, and the refusal even to consider the new and emotionally disturbing has no particular ethical merit." He also reviewed the impact of theoretical versions of science in

different fields and claimed that the success of mathematical physics led the social scientist to be jealous of its power without quite understanding the intellectual attitudes that had contributed to this power and the use of mathematical formulae that has accompanied the development of the natural sciences and has become the mode in the social sciences.

The home and the world of Man⁵ include not only the visible environment and Man himself but also the mental climate and stored learning with which we come into contact during every day of our lives. Medawar (1961, p. 96) has dealt with this point at length. He distinguishes between:

"'endosomatic' or internal heredity for the ordinary or genetical heredity we have in common with other animals; and 'exosomatic' or external heredity for the non-genetic heredity that is peculiarly our own - the heredity that is mediated through tradition, by which I mean the transfer of information through non-genetic channels from one generation to the next."

This is comparable with K.R. Popper's (1972) thesis of the three Worlds:

- a) world 1: physical world, objective;
- b) world 2: subjective world of conscious experiences; and
- c) world 3: objective knowledge, as in the logical contents of books and libraries and computer memories. [Note: books, libraries, computers are objects, i.e. world one.]

The links between these worlds are summed up by Popper in: "what may be called the second world - the world of the mind - becomes on the human level, more and more the link between the first and the third world: all our actions are influenced by our second-world grasp of the third world."

⁵ Hartshorne (1960) defined Geography as the 'study' that seeks to provide scientific description of the earth as the world of Man. Parallel with this and germane to the present topic, an editor of a book on the internal structure of the city perceived a theme that permeated definitions of the city - it was the city as the 'home of Man' (L.S. Bourne, 1971).

Perhaps this could be understood as a good demonstration of the Popperian view of the scientific method in which progress towards knowledge is made by error elimination or reduction (K.R. Popper, 1961, 131-4; 1968, 32-3; 1972, 406-7; see also B. Magee, 1973, 56; and J. Bird, 1975), as in the following sequence:

1. initial problem;
2. proposed theory;
3. deduction of testable propositions;
4. testing; (i.e. attempted refutation)
5. preference established among competing theories. (and further problems emerging.)

Conclusion of General Theoretical Framework of Attitudes

The hypothetico-deductive system, outlined in the five-stage process above, is in fact a dialogue between the possible and the actual. The discourse shows, like other exploratory processes, scientific method can be resolved into a dialogue between fact and fancy, the actual and the possible; between what could be true and what is the case. The purpose of scientific enquiry, therefore, is not to accumulate an inventory of factual information, nor to build up a totalitarian world picture of natural laws in which every event that is not compulsory is forbidden. **The concern of the thesis is rather as a logically articulated structure of justifiable beliefs about environment. It is as a story about a possible world - a story which the author invents and criticizes as he goes along so that it ends by being as near as he can make it, a story about real life.**

3.B

SYSTEM VIEW & STRUCTURALISM

Introduction to System View & Structuralism

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3.B.1.2. Different Applications of System

3.B.1.3. Control which Holds a System Together

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3.B.2.9.1. The Applications of Structuralism in Artificial Domain

Conclusion of System View & Structuralism

Introduction to System View & Structuralism

In accordance with the structure of the thesis, Part One is a conceptual framework of development theories and their applications in a synchronous domain. An attempt was made to use a deductive approach in reviewing the literature to widen the discourse about problem, development, participation and design process in this part to extract the hidden scientific principles from their deep structures, i.e. a diachronous domains. This was possible while the focus of the thesis, passing through different stages of different fields (i.e. management, planning, urbanization and architecture) was about design process in architecture. To chase the scientific principles of the propounded concepts in development and to synthesis them, an abductive methodology has been adopted in Part Two: Chapter Three in order to construct the model of endogenous development. Obtaining this goal, System View and Structuralism have been brought into consideration.

The history of science shows that last century's mechanistic world picture was closely related to the domination of the machine as a paradigm, the theoretical view of living beings as machines and the mechanization of Man himself. Concepts, which are coined by modern scientific developments, have their most obvious exemplification in life itself. **The applications of system in general have formulated terms such as wholeness and sum, differentiation, progressive mechanization, centralization, hierarchical order, finality and equifinality, etc.** These occur in all science dealing with 'systems' and imply their logical homology. Thus, there was a hope that the new world concept of science is an expression of the development towards a new stage in human culture.

Before the existence of any adequate dynamical theory for explaining the living processes, it was realized that eclipses occurred in regular predicable cycles, extending backwards and forwards over time. It was realized that time itself could be measured by the motion of the stars in their courses. The pattern for all events in the solar system was the revolution of a wheel or a series of wheels, whether in the form of the Ptolemaic theory of epicycles or the Copernican theory of orbits and in any such theory the future after a fashion repeats the past. There is no difference save of initial positions and directions between the motion of an orrery turned forwards and one run in reverse. When all this was reduced by Newton to a formal set

of postulates and a closed mechanics, the fundamental laws of this mechanics were unaltered by the transformation of the time-variable 't' into its negative (Wiener, 1948). If the seventeenth and early eighteenth centuries are the age of **clocks** and the later eighteenth and the nineteenth centuries constitute the age of **steam-engines**, the twentieth century is called by the same source the age of **communication and control**.

Being able to explain the functions of living systems, many started to talk about automaton. In the time of Newton, the automaton becomes the clockwork music box. In the nineteenth century, the automaton is glorified heat engine, burning some combustible fuel instead of the glycogen of the human muscles. In the middle of this century the automaton opens doors by means of photocells or points guns to the place which a radar beam picks up an aeroplane or computes the solution of a differential equation. Descartes considers the lower animals as automata. Just how these living automata function is something that he never discusses (Wiener, 1948). Thus, the modern automaton considered as the living organism. Vitalism has won to the extent that even mechanisms correspond to the time-structure of vitalism which is fully as mechanistic as the old. However, the debates about time and change in the living processes have been led to structuralism which is discussed briefly in the following text.

3.B.1. System View

Complex and Man-machine systems in technology, urbanization, social work, international relations and others still demand systemic approach. An increasing number of monographs, conferences and investigations confirm the importance of the theory and apply it in a broad range of disciplines including mathematics, biophysics, biology, geography, psychiatry, sociology, management science and education. The conceptual structure of system sciences is to help our understanding of living organism, of mental function and psychiatric disorder and of social organizations.

Talking about 'General System Theory', Bertalanffy (1968) says that it would play an important role in modern orientation in geography or that it parallels French Structuralism (e.g. suggested by Piaget and Levi-Strauss) and has exerted considerable influence on American Functionalism in society. He asserts that General System Theory is used by him

broadly, similar to the 'theory of evolution' or the 'behaviour theory'. He circumscribes three aspects to help distinguishing different realms of systems thinking and studies:

1. Systems Science; (i.e. scientific exploration and theory of 'systems' in the various sciences: such as physics, biology, psychology, social sciences, and General Systems Theory as a doctrine of principles applying to all systems.)
2. Systems Technology; (that is the problems arising in modern technology and society, comprising both the 'hardware' of computers, automation, self-regulating machinery, etc. and the 'software' of new theoretical developments and disciplines. The necessity of a holistic or systems approach and generalist or interdisciplinary nature in solving the systems' problems that is problems of interrelations of a great number of variables led to a new notions such as control and information theory, game decision theory, theory of circuits and queuing, etc.) and
3. Systems Philosophy. (I.e. the reorientation of thought and world view resulting from the introduction of system as a new scientific paradigm which is in contrast to the analytic, mechanist and one-way casual paradigm of classical science.)

Dividing the new philosophy of nature, the same source suggests three parts: Systems **Ontology** (real or concrete systems; conceptual systems and abstract systems); Systems **Epistemology** (as an interaction between knower and known, rejecting the idea of considering perception as a reflection of real things and knowledge as a simple approximation to 'truth' or 'reality'); and **Value Systems** (which is concerned with the relations of Man and world. If the reality is a hierarchy of organized wholes, the image of Man will be different from what it is in world of physical particles governed by chance events as ultimate and only true reality. Rather, the world of symbols, values, social entities and cultures is something very 'real'). This humanistic concern of General System Theory which makes it different from mechanistically oriented system theorists, speaking solely in terms of mathematics, feedback and technology, has been emphasised by the same author.

In Boulding's (1956, p. 197) words: "General Systems Theory is the skeleton of science in the sense that it aims to provide a framework or structure of systems on which to hang the flesh and blood of particular disciplines and particular subject matters in an orderly and coherent collection of knowledge." He also claims that science, for all its successes, still has a very long way to go. Therefore, General Systems Theory may at times be an embarrassment in pointing out how very far science still has to go and in deflating excessive philosophical claims for too simple systems. It also may be helpful in pointing out to some extent where it has to go. Somewhere between the specific that has no meaning and the general that has no content there must be, for each purpose and at each level of abstraction, an optimum degree of generality. It is the contention of the general systems theorists that **this optimum degree of generality in theory is not always reached by the particular sciences**. From this point of view and similar to General System Theories, the model of endogenous development is trying to build a new idea upon the optimum generalisation of the previous paradigms.

The same source indicates that the objectives of General Systems Theory at a low level of ambition but with a high degree of confidence is to point out similarities in the theoretical constructions of different disciplines and to develop theoretical models having applicability to at least two different fields of study:

1. at a higher level of ambition, but with perhaps a lower degree of confidence, it hopes to develop something like a 'spectrum' of theories; (a system of systems which may perform the function of a 'gestalt' in theoretical construction. Boulding says that such 'gestalts' in special fields have been of great value in directing research towards the gaps which they reveal. Thus, the periodic table of elements in chemistry directed research for many decades towards the discovery of unknown elements to fill gaps in the table until the table was completely filled.) and
2. similarly a 'system of systems' might be of value in directing the attention of theorists towards gaps in theoretical models and might even be of value in pointing towards methods of filling them. (See the discussion about surface structure and deep structure in previous section, i.e. 3.A.)

3.B.1.1. Types of System

Systems have been classified into different types. For example, they can be considered as closed and open systems. A closed system is one that is entirely contained within some envelope through which nothing passes either inwards or outwards. All changes go on within the bag which isolates the system from the rest of the world. In an open system, in contrast, things pass into the system from the outside are processes and something else is extruded outwards again (Waddington, 1977).

The conventional mechanical dynamics which are usually taught in school - all 'Newtonian mechanics'- applies to closed systems only. The great laws, of the impossibility of perpetual motion and the second law of thermodynamics: that things always tend to become less well ordered, are laws of closed systems. But, nearly all the systems one has to deal with in the real world are open systems because they are really part-systems. Waddington (1977) claims that the only completely closed system is the universe as a whole.

Since any sort of change requires some energy, the closed system can only undergo change if it includes a stock of energy-yielding material which can be gradually utilized. **Animals, plants, human society, ecosystems and so on are obviously open systems**, since they always receive inputs of food or other sources of energy and raw materials of various kinds; and produce various kinds of wastes and artifacts. Therefore, every living organism is essentially an open system (Burton, 1939). In the words of Bertalanffy (1968, p. 38): "It maintains itself in a continuous inflow and outflow, a building up and breaking down of components, never being so long as it is alive in a state of chemical and thermodynamic equilibrium but maintained in a so-called steady state which is distinct from the latter [homeostasis]." He also considers the need for the principle of equifinality¹ for open systems.

A useful description will usually characterize the situation as neither totally 'open' nor totally 'closed', but somewhere in between because: a totally open system would be one: in which the environment is so important that the system merges into it; which has an arbitrary boundary;

¹ Dependence on the future is an entity of 'finality' which is described in 3.B.1.9. in this section.

which has no stable identity; and is therefore very hard to manage or plan for. A totally closed system would be self-contained with no environment at all. It could not be influenced by external purpose. However, some useful systems may need to close temporality, e.g. for dormant periods, defensive retreat, internal reorganization, stock-taking, etc., or may have relatively closed sub-systems, e.g. frameworks that provide a fixed structure for the rest of the system (Carter et al., 1984).

Even within one particular system there may be subsystems or associated systems of different types. For instance, in an example of two persons conversing on the telephone there are:

- a) natural systems; (such as the ecosystems of rats or the weather systems of the wind which may influence the telephone system by gnawing cables or blowing down wires)
- b) abstract systems; (such as a set of linked mathematical equations or a computer programme.)
- c) designed systems; (such as the telephone hardware itself) and
- d) systems of human activities. (Such as a person phoning and an engineer repairing)

A particular system or sub-system may also be treated as 'soft' or 'hard'. 'soft' systems descriptions can be discussed and explored, but do not attempt to represent the original situation precisely and unambiguously because they involve emotional reactions, personal values and attitudes and shifting expectations. 'Soft' systems descriptions are 'personal' rather than 'technical' in attitude and tend to be used most for 'people' systems. Though, some non-people systems need to be treated in a 'soft' way too, e.g. some complex and unpredictable machines or intricate ecosystems. The 'hard' systems style is precise, well-defined and quantitative. It is used in situations where it makes sense to measure them, make models of them and expect them to behave with a predictable degree of regularity. Mechanical or electronic assemblies are often usefully described as 'hard' systems; highly routinised human activities can sometimes be treated in this way (Carter et al., 1984; and Rapoport, 1970).

By describing the kinds and explaining the behaviours of systems, Boulding (1956) also tries to shed light onto the ways of constructing a system of systems. He claims that there are two

possible approaches to the organization of General Systems Theory which are to be thought of as complementary rather than competitive. After describing the first approach which is to look over the empirical universe and to pick out certain general phenomena (three basic dimensions: **mass**, **energy**, and **information** which exist in the model of population change and the dynamic interactions of its members; the interaction of an individual and its environment; and growth theory) and are found in many different disciplines, he proposed a possible arrangement of 'levels' of theoretical discourse. In the second approach which is to arrange the empirical fields in a hierarchy of complexity of organization of their basic 'individual' or unit of behaviour. He tries to develop a level of abstraction appropriate to each. His proposal has been classified into the nine levels which can be summarized as:

1. the static structure; (or the level of framework which is about the geography and anatomy of the universe.)
2. the simple dynamic systems with predetermined and necessary motions; (this might be called the level of clockwork.)
3. the control mechanism or cybernetic systems; (which might be named the level of the thermostat.)
4. the open system; (or self-maintaining structure. This is the level at which life begins to differentiate itself from not-life: it might be called the level of cell. Flames and rivers likewise are essentially open systems of a very simple kind.)
5. the genetic-societal level; (which is typified by plant.)
6. the animal level; (characterized by increased mobility, teleological behaviour and self-awareness.)
7. the human level; (in which Man processes self-consciousness. This is different from mere awareness. His image has a self-reflexive quality - he not only knows, but knows that he knows. This property is probably bound up with the phenomenon of language and symbolism.)
8. the social organization level; (this is tempting to define social organizations or almost any social system as a set of roles tied together with channels of communication.) and
9. the transcendental systems. (See Figure 3.B.1.)

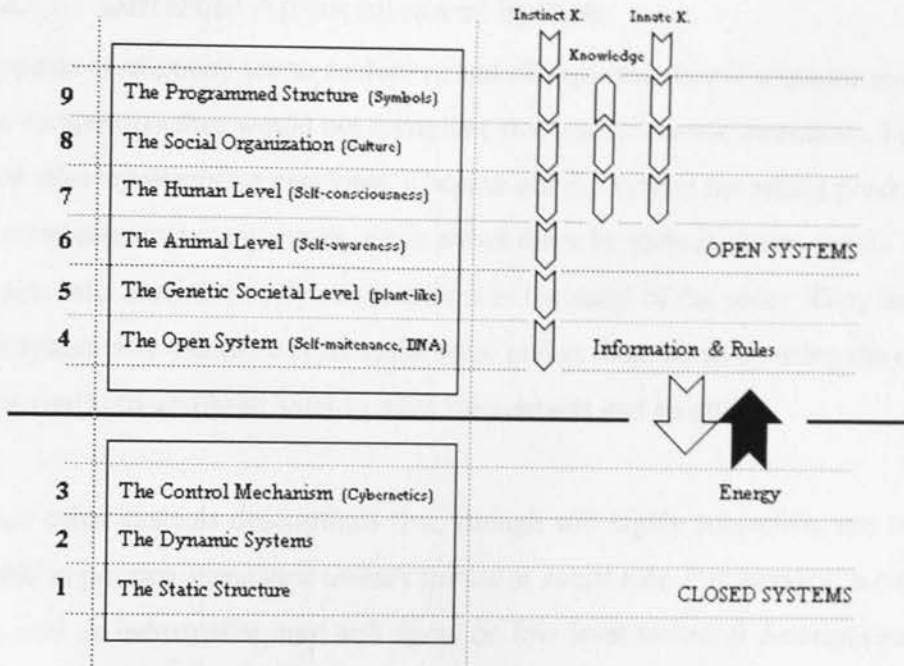


Figure 3.B.1 The skeleton of science [adapted to Boulding (1956) and Bertalanffy (1968)]

In the proposed model the dominance of instinct knowledge covers living systems to control their biological behaviours, innate knowledge controls spirituality and morality in human beings, either individually or socially; and knowledge has also a certain domain with a reversible flow.

Source: the author

Higher levels as a rule presuppose lower ones in this model, e.g. life phenomena, those at the physico-chemical level, socio-cultural phenomena, the level of human activity, etc. But, the relation of levels requires clarification in each case for example problems such as open system and genetic code of 'life'; relation of 'conceptual' to 'real' systems, etc. In this sense, the model suggests both the limits of reductionism and the gaps in actual knowledge. Moreover, the above consideration pertains particularly to a concept or complex of concepts which is fundamental in the general theory of the systems: that of 'hierarchic order'. Bertalanffy (1968, p. 25) claims that a similar hierarchy is found both in 'structures' and in 'functions'. He said: "structure (order of parts) and function (order of processes) may be the very same thing: in the physical world matter dissolves into a play of energies and in the biological world structures are the expression of a flow of processes."² (See Pattee's classification in 3.B.2.7.)

² See Table 1.2 in page 26-27 of Bertalanffy (1968) which illustrates Boulding's proposals in another way.

3.B.1.2. Different Applications of System

Some systems descriptions are so subjective and idiosyncratic that if someone else looked at the same components they would not recognise any systemic interconnections. For instance, a regional sales representative may 'own' a human activity system for selling products. It may contain many objective components: a car, travel times by various routes, useful hotels, lists of contacts, etc. But, their only connection is in the mind of the seller. They function as a coherent system only because this particular seller makes them do so by using the car to drive down the routes to go to the hotel to meet the contacts and so on.

There are other systems descriptions that, though still highly subjective, are rather more 'predictable' in practice, given their owner's culture or social role. For instance, a monk, a civil servant, and an industrialist may well agree on low level technical descriptions but when considering high level problems, such as how to govern the country, their system descriptions and the actions that follow from them may differ dramatically, because:

- a) they have different ultimate goals (pursuing enlightenment, implementing government policies and entrepreneurial development) and different criteria; (as to what short-term stresses are acceptable en route)
- b) they have different theories about how events affect one another; (in areas of great complexity where many theories are equally plausible) and
- c) they have such different methods of communication that discussion between them is difficult, even though they are all responding to the same underlying human nature.

However, some systems descriptions are much less personal and rely on more tangible links. In these cases, different observers are more likely to come up with quite similar descriptions. People who live in a village may be more closely connected to one another than to outsiders in terms of communication, friendships, employment and many other factors. So, very different systems description owners with very different descriptive purposes might still find themselves drawing quite similar systems boundaries around the village system.

There is also a hierarchy of possible levels of systems description as well. For instance, a

system description of a regional development strategy would be high on the hierarchy, which has been illustrated in Figure 3.B.2, with:

- broad scope; (political indications, direction of development according to the national 5 years plans, employment, etc.)
- coarse resolution; (elements such as: allocating money for implementing some projects, changes in structural plans, etc.) and
- long time scale. ('Structure' includes things like: transport network and accessibility to new technology; 'process' including things like: sectoral management, services and production processes, etc.)

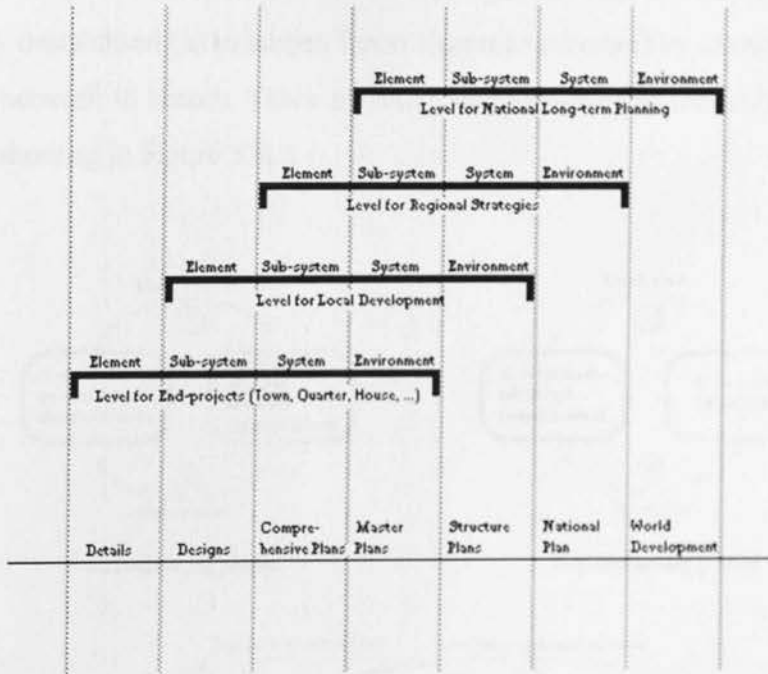


Figure 3.B.2 The diagram shows a hierarchy of possible levels of design description.
Source: the author

Whereas a system description of building a space would be lower down the hierarchy with:

- limited scope; (having a space.)
- finer resolution; (having a design and enough money for construction.) and
- shorter time scale. ['structure' includes building construction that would be 'process' for regional scales strategy; process lasts using a space. (Figure 3 B.2)]

3.B.1.3. Control which Holds a System Together

Any persisting pattern of activity that can be described as a system must involve processes that hold it together, otherwise it would tend to degenerate. So, the 'structure and the process' of a system and the 'control' of the system are two sides of the same coin. Carter et al. (1984) describe this phenomenon and claim that there are different types of control:

- a) the natural ecosystems of tropical rain forests illustrate the most basic form of control, [they can be stable in nature with no sense of purpose, no special controller, no free choice and no grand design. They are controlled by an immensely complex 'self-maintaining causal network' (similar to the forth stage of Boulding's classification in Figure 3.B.1) that will hold itself in the same general state indefinitely, unless it is radically destabilised (as in human forest clearance schemes) by changes too drastic for the network to absorb. There are much simpler networks that enhance or resist change showing in Figure 3.B.3.]

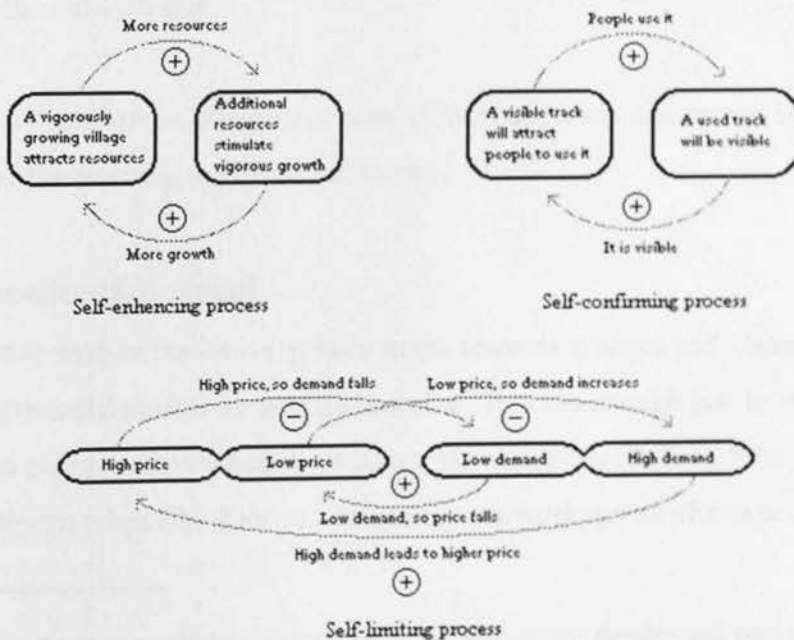


Figure 3.B.3 Some simple networks that enhance or resist change
Source: Carter et al. (1984)

- b) purposive control; (which is more sophisticated in that there are specialised control

subsystems directed to achieving the goal, but the goal itself is still preset. This is 'purpose without choice' like the migrating bird or computer programmed and controlled by inherited instinct or learned habit to aim for one goal: home.) and

- c) deliberately controlled human activity. [This is the most complex form of control. It can be called 'purposeful control'. (purposeful with choice)]

The purposeful control which is the main emphasis of the thesis in the model of endogenous development involves:

- a) specialised arrangements for decision making and control; (e.g. while the fields get on with the growing, the farmer specialised in planning and control.³)
- b) free choice among several competing alternatives⁴; (e.g. there are alternate patterns of crops that the farmer might grow; s/he can choose between them on whatever criteria s/he wishes.⁵) and
- c) the result is some sort of blueprint or plan. (What happens is determined by the plan, not just by the working out of natural forces.)

3.B.1.3.1. Feedback Control

Carter et al. (1984) analyse the way a system steers towards a target and claim that both purposive and purposeful models involve a 'controller'. It is not enough just to operate the control knob in the example when somebody is taking shower (Figure 3.B.4). S/he also needs to check what happens when s/he does so, things may not work out as s/he expects. This is

³ This arrangement is a part of production process, one of the endogenous development paradigms in diachronous domain which has been discussed in Chapter Four: The Model (4.B).

⁴ There is a difference between opportunity and choice. The former is limited and related to the environment as outsider's influence and the later is about the system itself. For instance, good market may create opportunities for the consumers in which their choices may increase or decreases.

⁵ The competing alternatives are the result of supply-demand relationship in synchronous domain which is the second paradigm of the model of endogenous development described in Chapter Four: The Model (4.B).

'adaptive control', sometimes called 'feedback' or 'closed loop' control, because information about the results is fed back to the controller, so 'closing the loop' needs: feeling the water; if necessary taking corrective action; feeling the water again; corrective action again if it is necessary. If the checking side of the loop is missed out, the controller will not know if something went wrong.

The same source claims that checking and adjusting can be expensive; and if the time-lag in the closed loop means that the adjustment is too out of date when somebody makes it feedback can even make things worse. But, the concern of the thesis is that the observer's role, while creating the condition for satisfying the needs which involves her/his mental process, is a key point and a matter of significance in the development processes. This manifests itself into either evolution of thought or progression of the products [see production process in Chapter Four: The Model (4.B)]. Notice that in some systems there is a human link in the chain of the transmission and return of information: in what is called 'the chain of feedback'. There are also feedback chains in which no human element intervenes. The ordinary thermostat by which we regulate the heating of a house is one of these (Wiener, 1948).

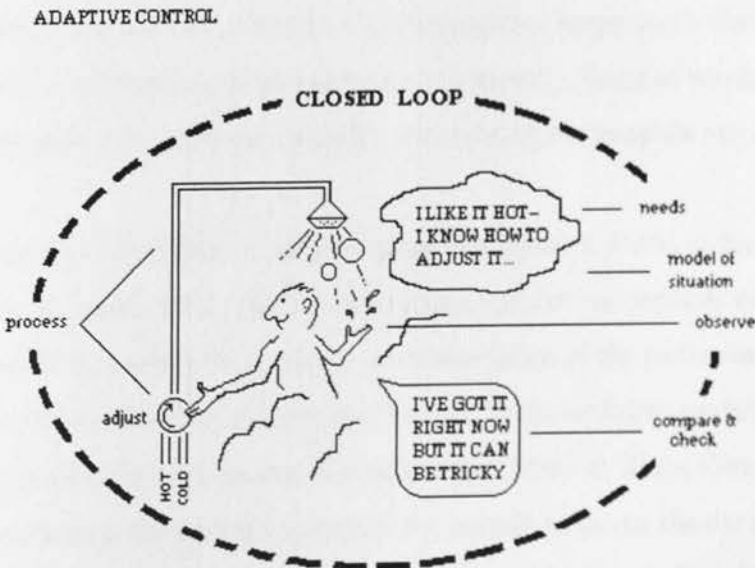


Figure 3.B.4 Closed loop or feedback (adaptive) control
[derived from Carter et al. (1984)]

There are examples of negative feedbacks to stabilize temperature and negative feedbacks to stabilize position as in the steering engines of a ship which are actuated by the angular difference between the position of the wheel and the position of the rudder and always act to bring the position of the rudder into accord with that of the wheel. The feedback of voluntary activity in a community is also of this nature. The effect of heavy negative feedback, if it is at all stable, will be to increase the stability of the system for low frequencies, but generally at the expense of its stability for some high frequencies. There are many cases in which even this degree of stabilization is advantageous.

Following the above discussion, Wiener (1948, p. 133) claims that feedbacks of this general type are found in human and animal reflexes and then he refers to another kind of feedback in the example of duck-shooting and says: "When we go duck-shooting, the error which we try to minimize is not that between the position of the gun and the actual position of the target, but that between the position of the gun and the anticipated position of the target. Any system of antiaircraft fire control must meet the same problem." '**Anticipatory feedback**' is also a useful principle in design process to justify the designers' concern about the fact that it is time-dependent phenomena, therefore its outcome should meet the anticipated input somewhere in the axle of time to help making closet response to the user's real needs (this mechanism is referred to in Chapter Four: The Model). In other words in long run planning and design processes, there is a need for anticipating the people's real needs in the future.

Another variant of feedback or adaptive control systems is found in the way in which people steer a car on an icy road. Their entire conduct of driving depends on a knowledge of the slipperiness of the road-surface: that is on a knowledge of the performance characteristics of the system car-road. If they wait to find this out by the ordinary performance of the system, they shall discover themselves in a skid before they know it. They, thus, give to the steering-wheel a succession of small fast impulses not enough to throw the car into a major skid, but quite enough to report to their kinaesthetic sense whether the car is in danger of skidding and they regulate their method of steering accordingly (Wiener, 1948). Similar to the Wiener's example of steering a car, the notion of flexibility in design process is due to help designers to adapt their schemes with real situation to cope with the design problems.

3.B.1.3.2. Feed-forward Control

There is sometimes a 'non-adaptive control' where most of the effort goes into setting the system up correctly and reliably in advance so that subsequent checking is not needed (Figure 3.B.5). For instance, a publisher checked the proofs of a book carefully, but once it was on the press no one proofread each copy. This is sometimes called 'feed-forward' or 'open-loop' control, because the controller has to predict in advance the exact action needed and the loop is not closed by checking the results (Carter et al., 1984). In this regard, the thesis is concerned about feed-forward control as a metaphor by which the notion of industrial production can be more illustrated. **The thesis argues that Taylorism whose proposal led to the social class of labours; Fordism whose proposal led to assembly line and simplification of the work; and feed-forward control which determines the users' participation and authority in production processes, in the sake of accuracy and effectiveness of the products, are among those which give ways to the industrial production.** The applications of industrialization in the design processes are limited to the frameworks imposed by pre-designed principles. Therefore, designers have to assemble preadjusted concepts to create new images which may be far from the genuine schemes. These are all helping the specification of the works, thus professionalism. [See Introduction; Chapter Two: Design Process (2.A); and also Islami, 1997b.]

NON-ADAPTIVE CONTROL

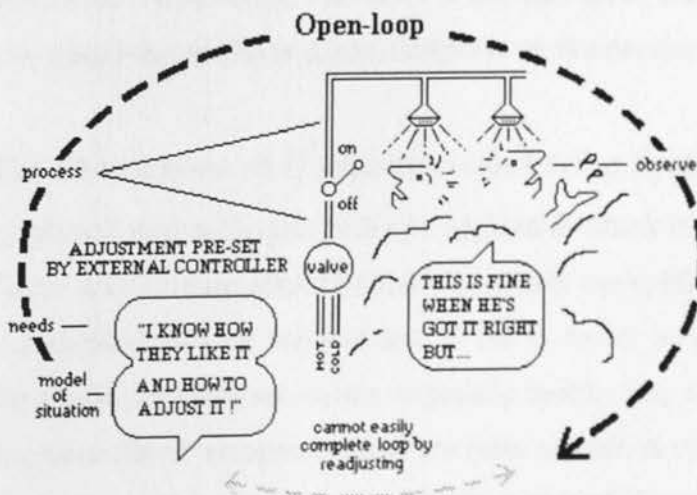


Figure 3.B.5 Open-loop or feed-forward (non-adaptive) control
[derived from Carter et al. (1984)]

Following the argument, Mitchell (1990, p. 207) also refers to the accuracy of the products as the main goal for functionalists and quotes from them who take Aristotelian view of architecture in their criticism as if it deals: "with the adequacy of means to those ends. The usual ends are to provide adequate space for specified activities to achieve adequate performance of the structural system and other physical subsystems and to exemplify, express, and allude in memorable ways. More concisely in the famous words of Sir Henry Wotton, "the ends of architecture are commodity, firmness, and delight." Ignoring the broader impacts of adaptive and non-adaptive control in social life, it is worthwhile to mention that both methodologies need:

- a) knowledge about the system; (i.e. a 'model' that lets the controller judge the likely effects of possible actions.) and
- b) awareness of the 'needs'. (That the controller is trying to achieve similar to the role of ultimate cause in the production process paradigm.)

In a complex system (e.g. production process paradigm in the model of endogenous development presented in Chapter Four), there has to be some sort of overall coordinated control as well as the control of individual tasks. It is not too hard to see who made the purposeful choices (e.g. the users or the clients) in this system and who got stuck with the purposive model (e.g. the designers or the producers).

3.B.1.4. The Mechanism of Homeostasis in Living Systems

Another important physiological application of the principle of feedback is worth mentioning. A great group of cases in which some sort of feedback is not only exemplified in physiological phenomena but is essential for the continuation of life is found in what is known as 'homeostasis'. The conditions under which life, especially healthy life, can continue in the higher level of the hierarchy of the open-systems are quite narrow. A variation of one half degree centigrade in the body temperature is generally a sign of illness and a permanent variation of five degrees is scarcely consistent with life. The waste products of the body must be excreted before they rise to toxic concentrations. Besides all these heart rate and blood

pressure must neither be too high not too low; and so on. In short, the inner economy of our body must contain an assembly of thermostats, automatic hydrogenion-concentration controls, governors, and the like which would be adequate for a great chemical plant. These are what scientists know collectively as the homeostatic mechanism.

In social science, small and closely knit communities have a very considerable measure of homeostasis; and this is whether they are highly literate communities or primitive groups. They generally have a very definite homeostatic value. It is only in the large community where the owners of things as they are protecting themselves from hunger by wealth, from public opinion by privacy and anonymity, from private criticism by the laws of libel and the possession of the means of communication that inhuman can reach its most high levels. These are named by Wiener (1948) 'anti-homeostatic' elements. Of all of these anti-homeostatic factors in society, the control of the means of communication is the most effective and most important mentioned by the same source. Wiener (1948, p. 186) also expressed his idea about homeostasis in society by propounding an extremely cynical statement: "There is no homeostasis whatever. We are involved in the business cycles of boom and failure in the successions of dictatorship and revolution, in the wars which everyone loses, which are so real, a feature of modern times." This discussion will be more elaborated in the following text.

3.B.1.5. Entropy of a System

For better understanding the impact of the homeostatic and anti-homeostatic elements in bringing steady states for systems, it is worthwhile to pinpoint the second law of thermodynamic and the notion of entropy. The amount of information in a system attaches itself to a classical notion in statistical mechanics: 'entropy'. Just as the amount of information in a system is a measure of its degree of organization, the entropy of a system is a measure of its degree of disorganization; and that one is simply the negative of the other (Wiener, 1948). This point of view leads us to a number of considerations concerning the second law of thermodynamics.

According to the second law of thermodynamics, the general trend of events in physical nature is towards states of maximum disorder and levelling down of differences with the so-called

heat death of the universe as the final outlook when all energy is degraded into evenly distributed heat of low temperature and the world process comes to stop (Bertalanffy, 1968). In contrast, the same source indicates that in the living world a transition is towards higher order, heterogeneity and organization. **But on the basis of the theory of open systems, the apparent contradiction between entropy and evolution disappears.** System theory suggests that in all irreversible processes entropy must increase. Therefore, the change of entropy in closed systems is always positive; order is continually destroyed. In open systems, not only production of entropy due to irreversible processes, but also import of entropy, which may well be negative, is a matter of concern. This is the case in the living organism which imports complex molecules high in free energy. Thus, **living systems, maintaining themselves in a steady state, can avoid the increase of entropy and may even develop towards states of increased order and organization.**

The laws of thermodynamics apply only to closed systems. In particular, the second principle of thermodynamics states that in a closed system a certain quantity, called 'entropy', must increase to maximum and eventually the process comes to a stop at a state of equilibrium. In living systems such as society, increase of information helps reduction of heterogeneity in organization using the feedback control. On the contrary to the cybernetics, by feeding back the information into an living system it will not remain the same. To find out this difference, a brief review about the definition of cybernetic has been adopted in the followings.

3.B.1.6. Cybernetic Theory and the Open System Model

The group of scientists including Dr. Rosenblueth and Wiener became aware of the essential unity of the set of problems involving communication, control and statistical mechanics, whether in the machine or in living tissue, in 1944. The lack of unity of the literature concerning these problems and the absence of common terminology or even of a name for the field were the real problem for them. After much consideration, they came to the conclusion that all the existing terminology has too heavy a bias to one side or another to serve the future development of the field, therefore they coined an artificial neo-Greek expression to fill the gap. They decided to call the entire fields of control and communication theory, whether in the machine or in the animate, by the name 'cybernetics' which they formed from Greek words

means Steers-Man (Wiener, 1948).

Introducing a cybernetics conference, Frank et al. (1948) state that system theory and cybernetics are similar phenomenon. They referred to the necessity of a search for new approaches for new and more comprehensive concepts and for methods capable of dealing with the large wholes of organisms and personalities. The concept of teleological mechanisms was for them an attempt to escape from these older mechanistic formulations that appear inadequate to provide new and more fruitful conceptions and more effective methodologies for studying self-regulation processes; self-orientating systems; and organisms and self-directing personalities. Thus, the terms 'feedback', 'servomechanisms', 'circular systems' and 'circular processes' were viewed by them as different but equivalent expressions of much the same basic conception.

Cybernetics is a theory of control systems based on communication (transfer of information) between system and environment and within the system; and control (feedback) of the system's function in regard to environment. Comparing this with 'system theory', Bertalanffy (1968) claims that these two are different phenomena. In biology and other basic sciences, the cybernetic model is apt to describe the formal structure of regulatory mechanisms. Thus, the regulatory structure can be recognized, even though actual mechanisms remain unknown and undescribed, and the system is a 'black box' defined only by input and output. For similar reasons, the same cybernetic scheme may apply to hydraulic, electric, physiological, etc. systems. The same source adds that the highly elaborate and sophisticated theory of servomechanism in technology has been applied to natural systems only to a limited extent.

Elsewhere by criticising the theories associated with General System Theory, Bertalanffy (1968) indicates that because of the overextended expectations cybernetics proved that it did not yield an all-embracing explanation or grand world view being an extension rather than a replacement of the mechanistic view and machine theory (see also Bronowski, 1964). **Concepts and models of equilibrium, homeostasis, adjustment, etc., are suitable for the maintenance of systems, but inadequate for phenomena of change, differentiation, evolution, production of improbable states, creativity, building up of tensions, self-**

realization, emergence, etc. He also claims that the theory of open systems applies to a wide range of phenomena in biology, but the warning is necessary against its application to the fields for which its concepts are not made.

The basis of open-system model, as it was reviewed, is the dynamic interaction of its components. The basis of the cybernetic model is the feedback cycle in which, by way of feedback information, a desired value is maintained, a target is reached, etc. The theory of open systems is a generalized kinetics and thermodynamics. Cybernetic theory is based on feedback and information. In kinetic and thermodynamic formulations, the open-system model, does not talk about information. On the other hand, a feedback system is closed thermodynamically and kinetically; it has no metabolism. In an open system, increase of order and decrease of entropy is thermodynamically possible. The magnitude 'information' is defined by and expression formally identical with negative entropy. However, in a closed feedback mechanism information can only decrease, never increase (Bertalanffy, 1968).

Consequently, an open system may 'actively' tend towards a state of higher organization. A feedback mechanism can 'reactively' reach a state of higher organization owing to '**learning**'. Bertalanffy identifies two kinds of regulation: 'primary' and 'secondary'⁶. The feedback model is applicable to secondary regulations. Since the structures of the organism are maintained in metabolism and exchange of components, primary regulations must evolve from the dynamics in an open system. Although some problems associated with these models have been brought into consideration by the same author, but it is useful to pursue their effectiveness in justifying the cultural evolutions which are the result of production process paradigm in endogenous societies (see Chapter Four: The Model for more details). Getting insight the complexity associated with living systems especially that of purposeful systems, the author would like to open a brief discussion about a significant principle of system theory, i.e. 'finality'.

3.B.1.7. Is Finality as the Reverse of the Causality?

The sense of 'dependence on the future' is an entity of finality which is a principle of system

⁶ See Hess's (1941) arguments in biology for more details.

theory mentioned by Bertalanffy (1968). He explains that 'happenings' can be considered and described as being determined not by actual conditions, but also by the final state to be reached⁷. In a general nature, this not only applies to mechanics, but to any kind of system. He also pinpoints the differences between finality and causality and indicates that the directedness of the process towards a final state is not a process differing from causality, but another expression of it. In other words, with respect to animate rather than to inanimate nature the intention is to compare finalistic processes with human foresight of the goal. **Finality was also defined as the reverse of causality as dependence of the process on future instead of past conditions.** This was objected to by Gross (1930) who said that according to this conception, a state 'a' would depend on a state 'b' in the future, an existent on a non-existent (see the discourse about cause and effect relationship in Chapter Four: 4.B).

Bertalanffy (1968) distinguishes two types of problems related to finality. First, 'static teleology' or 'fitness': meaning that an arrangement seems to be useful for a certain 'purpose', e.g. a fur coat is fit to keep the body warm and so are hairs, feathers or layers of fat in animals. Secondly, 'dynamic teleology': meaning a directiveness of processes which is also the notice of this thesis. Being concerned about this definition, the author would like to extend this discussion by referring to a clarification done by Bertalanffy (1948, 1965) about different phenomena related to this matter:

- a) direction of events towards a final state which can be expressed as if the present behaviour were dependent on that final state; (every system which attains a time-independent condition behaves in this way.)
- b) directiveness based upon structure; [meaning that an arrangement of structure leads the process in such way that a certain result is achieved, e.g. in the function of Man-made machines. In living nature, it is possible to find a structural order of processes that in its complication widely surpasses all Man-made machines. Whilst Man-made

⁷ The implementation of this is quite similar to the Interactivists idea who believe that the formulation of ideals and the design of idealized futures are not empty exercises in utopianism, but necessary steps in setting long-range direction for continuous development. The future, they argue, depends more on what we do between now and then than it does on what has happened until now (see Problem Identification in Chapter One: 1.A).

machines work in such a way as to yield certain products and performances, the order of process in living systems is such as to maintain the system itself. An important part of these processes is represented by homeostasis. These regulations are governed by feedback mechanisms. Feedback means that from the output of a machine a certain amount is monitored back, as 'information', to the input so as to regulate the latter and thus to stabilize or direct the action of the machine. Feedback mechanisms appear to be responsible for a large part of organic regulations and phenomena of homeostasis, as emphasised by cybernetics. (See the discussion about homeorhesis in 3.B.2.7.)]

- c) equifinality as another basis for organic regulations; (meaning that the same final state can be reached from different initial conditions and in different ways. This is found to be the case in open systems, as they attain a steady state.) and
- d) finally, there is true finality or purposiveness. (Meaning that the actual behaviour is determined by the foresight of the goal.)

The final part is the original Aristotelian concept. It presupposes that the future goal is already present in thought and directs the present action. In other words, there is a move from future to present. True purposiveness is characteristic of human behaviour and it is connected with the evolution of the symbolism of language and concepts explained in the followings.

3.B.1.8. Teleology and Directiveness in Purposeful Systems

Systems changes have been brought into consideration by many commentators as well as Ackoff (1971) who tries to introduce a system of systems concepts. Reaction, response, act of a system and a system's behaviour are his classification for systems changes. He describes them as: a 'reaction' of a system is a system event for which another event that occurs to the same system or its environment is sufficient. A 'response' of a system is a system event for which another event that occurs to the same system or to its environment is necessary but not sufficient; that is a system event produced by another system or environmental event (the stimulus). Therefore, a person's turning on a light when it gets dark is a response to darkness, but the light's going on when the switch is turned is a reaction. An 'act' of a system is a system

event for the occurrence of which no change in the system's environment is either necessary or sufficient. Systems, all of whose changes are reactive, responsive, or autonomous (active) are called by the same source reactive, responsive, or autonomous (active) responsively. Most systems, however, display some combination of these types of change which are based on consideration of what brings them about. Now, it is time to talk about a system's 'behaviour' which is a system event(s). It is either necessary or sufficient for another event in that system or its environment. Therefore, behaviour consists of system events whose consequences are of interest. After these considerations Ackoff suggests his proposal about behavioural classification of systems in a way which is illustrated in Table 3.B.1.

Type of System	Behaviour of System	Outcome of Behaviour
State-Maintaining	Variable but Determined (reactive)	Fixed
Goal-Seeking	Variable and Chosen (responsive)	Fixed
Multi-Goal-Seeking and Purposive	Variable and Chosen	Variable but Determined
Purposeful	Variable and Chosen	Variable and Chosen

Table 3.B.1 Behavioural Classification of Systems (derived from Ackoff, 1971)

According to the table above, a 'state-maintaining' system must be able to discriminate between different internal or external states to changes in which it reacts. Such systems are necessarily adaptive, but unlike 'goal-seeking' systems they cannot learn, because they cannot choose their behaviour. They cannot improve with experience. A goal-seeking system has a choice of behaviour and its behaviour is responsive, but not reactive. The sequence of behaviour which a goal-seeking system carries out, in quest of its goal, is an example of a process⁸ which is a sequence of behaviour that constitutes a system and has a goal-producing function. A 'multi-goal-seeking' system is similar to a goal-seeking system but seeks different goals in at least two different states, the goal being determined by the initial state.

A 'purposive system' is a multi-goal-seeking system the different goals of which have a

⁸ Describing the metabolic process in living things whose goal is survival, Ackoff (1971, p. 666) says: "Production processes are a similar type of sequence [acquisition of energy] whose goal is a particular type of product". But, the production process paradigm, proposed in this thesis, is about the life of ideal-seeking systems whose objectives are to pursue their 'perfections'.

common property. Production of that common property is the system's purpose. These types of system can pursue different goals but they do not select the goal to be pursued. The goal is determined by the initiating event. **Such a system does choose the means by which to pursue its goals**, like a computer which has more than two games and the choice for playing each game is determined by an instruction from an external source but it is purposive because 'game wining' is one of its different goals to be sought.

A 'purposeful system' is one which can produce the same outcome in different ways in the same (internal or external) state and can produce different outcomes in the same and different states. Thus, it is one which can change its goals under constant conditions; **it selects ends as well as means and thus display will. A system which can choose between different outcomes can also place different values on different outcomes.** Human beings are the most familiar examples of such systems. The differences between 'goals', 'objectives' and 'ideals' have relevance only to purposeful systems because only they can choose ends. Ackoff defines them as:

- a) the 'goal' of a purposeful system; (which is, in a particular situation, a preferred outcome that can be obtained within a specified time period.)
- b) the 'objective' of a purposeful system; (which is, in a particular situation, a preferred outcome that cannot be obtained within a specified period but which can be obtained over a longer time period.) and
- c) an 'ideal'. (That is an objective which cannot be obtained in any time period but which can be approached without limit. Just as goals can be ordered with respect to objectives, objectives can be ordered with respect to ideals. **But, an ideal is an outcome which is unobtainable in practice, if not in principle**)

An 'ideal-seeking system' is a purposeful system which, on attainment of any of its goals or objectives, seeks another goal and objective which more closely approximates its ideal. Ideal-seeking system is one which has a concept of 'perfection' or the 'ultimately desirable' and

pursues it systematically; that is in interrelated steps. These steps might be similar to the stages of production process paradigm⁹ which has been suggested in this thesis. Therefore, Ackoff's suggestion can be classified into six types of system: state-maintaining, goal-seeking, multi-goal-seeking, purposive, purposeful, and ideal-seeking systems.

3.B.1.8.1. Learning and Adapting in Purposeful Systems

Talking about cybernetics, it was reviewed that an open system may 'actively' tend towards a state of higher organization. A state of higher organization can be reached by a feedback mechanism 'reactively' as well, owing to learning. '**Learning**' and '**adapting**' are also two key principles in the processes of development in human societies and evolution of their cultures. Therefore, these concepts will be under consideration in the following paragraphs. To deal with them, it is necessary first to consider the concepts 'function'. In the words of Ackoff (1971, p. 668): "Function(s) of a system is production of the outcomes that define its goal(s) and objective(s)." In another word, to function is to be able to produce the same outcome in different ways [see also the discussion about function and form and their relationship in Chapter Two: Design Process (2.B)]. Now, it is time to refer to definition of adaptation propounded in page 668 of the same source:

"A system is adaptive if, when there is a change in its environmental and/or internal state which reduce its efficiency in pursuing one or more of its goals which define its function(s), it reacts or responds by changing its own state and/or that of its environment so as to increase its efficiency with respect to that goal or goals. Thus, adaptiveness is the ability of a system to modify itself or its environment when either has changed to the system's disadvantage so as to regain at least some of its lost efficiency."

Following the above citation, the definition of 'adaptive' also implies four types of adaptation:

1. 'other-other adaptation'; (a system's reacting or responding to an external change by

⁹ Production process consists of ultimate cause; subjective cause; objective cause/effect; and formal cause/effect which have been discussed implicitly in Chapter Four: The Model (4.B).

modifying the environment, e.g. when a person turns on an air conditioner in a room that has become too warm for him to continue to work in; or when the objective in development strategies is to sustain the built environment.)

2. 'other-self adaptation'; (a system's reacting or responding to an external change by modifying itself, e.g. when the person moves to another and cooler room; or when people emigrate from small towns to a metropolitan area because of its services and cause accumulation and integration of the populations. This type of adaptation is most commonly considered because it was this type with which Darwin was concerned in his studies of biological species as systems.)
3. 'self-other adaptation'; (a system's reacting or responding to an internal change by modifying the environment, e.g. when a person who has chills due to a cold turns up the heat; or when the development strategies, according to their objectives, are selective in pursuing the means by modifying the environment) and
4. 'self-self adaptation'. (A system's reacting or responding to an internal change by modifying itself, e.g. when that person takes medication to suppress the chills; or when an organization, as a system, is able to create and select the means and ends for its development or solving its problems without interference of the outsiders, such organizations can be found in self-sufficient and endogenous communities).

To **'learn'** is to increase one's efficiency in the pursuit of a goal under unchanging conditions. Thus if a person increases her/his ability to hit a target (her/his goal) with repeated shooting at it, s/he learns how to shoot better (see the example about steering-car in 3 B.1.3.1.). To do so requires an ability to modify one's behaviour (i.e. to display choice) and memory. It is mentioned by system commentators that learning can take place only when a system has a choice among alternative courses of action, therefore only those systems that are goal-seeking or higher can learn. If a system is repeatedly subjected to the same environmental or internal change and increases its ability to maintain its efficiency under this type of change, then it learns how to adapt. Thus, adaptation itself can be learned.

In system view, it is necessary to study not only parts and precesses in isolation, but also to save the decisive problems found in the organizations and order unifying them, resulting from dynamic interaction of parts, and making the behaviour of parts different which are studied in isolation or within the whole. In the social sciences, the concept of society as a sum of individuals as social atoms, e.g. the model of Economic Man, was replaced by the tendency to consider society, economy and nation as a whole superordinated to its parts. This implies the great problems of planned economy, of the worship of nation and state but also reflects new ways of thinking (Bertalanffy, 1968).

Management Scientists are most concerned with that type of system called 'organization'. On the other hand, cyberneticists are more concerned with that type of system called 'organisms', but they frequently treat organizations as though they were organisms (Ackoff, 1971). There is an important difference between them which may help understanding the notion of change in society and the process of its transformation and evolution in development. Ackoff (1971) defines organization by considering four essential characteristics for it:

1. an organization is a purposeful system; (that contains at least two purposeful elements which have a common purpose. Organization of a system is an activity that can be carried out only by purposeful entities; to be an organization a system must contain such entities. An organization is always organized around at least one common purpose. It is the relationships between what the purposeful elements do and the pursuit of their common purpose that give unity and identity to their organization. **An organization consists of elements that have and can exercise their own wills.**)
2. an organization has a functional division of labour; [in search for the common purpose(s) of its elements that define it. The classes of courses of action and the subsets of elements may be differentiated by a variety of types of characteristics; for example: by 'function' (e.g. production, marketing, research, finance and personnel in the industrial context); by 'space' (e.g. geography, as territories of sales offices); and by 'time' (e.g. waves of an invading force).]

3. the functionally distinct subsystem (subset) can respond to each other's behaviour through observation or communication; (the choices made by elements or subsets of an organization must be capable of influencing each other, otherwise they would not even constitute a system.) and
4. at least one subset of the system has a system-control function. (This subset or subsystem compares achieved outcomes with desired outcomes and adjusts the behaviour of the system which are directed towards reducing the observed deficiencies. It also determines what the desired outcomes are. The control function is normally exercised by an executive body which operates on feedback principle.)

Summarising Ackoff's suggestions, an organization is a purposeful system that contains at least two purposeful elements which have a common purpose relative to which the system has a functional division of labour; its functionally distinct subsystems can respond to each other's behaviour through observation or communication; and at least one subset has a system-control function. Therefore, the critical difference between organism and organization, which are usually mixed with each other in the literature of system theory and structuralism, is that , whereas both are purposeful systems, **organisms do not contain purposeful elements**. The elements of an organism may be state-maintaining, goal-seeking, multi-goal-seeking or purposive; but not purposeful. Thus, **an organism must be variety increasing**. An organization, on the other hand, may be either variety increasing or decreasing (e.g. the ineffective committee). **In an organism, only the whole display will; none of the parts can.** Porter (1965) pinpoints human organization from a different angle when he says; "... , whereas the removal of one molecule from a million will have no observable effect, the removal of one Man may change the course of history."

It has been also proved that the scientific scheme of isolable units acting in one-way causality is insufficient. Hence, **the appearance of notions like wholeness, holistic, organismic, gestalt, etc., all signify thinking in terms of systems of elements in mutual interaction**. The notion of teleology and directiveness appeared to be outside the scope of science and to be the playground of mysterious, supernatural or anthropomorphic agencies, alien to science

and merely a misplaced projection of the observer's mind into a nature governed by purposeless laws (Bertalanffy, 1968). It is also hard to conceive of a living organism, not to speak of behaviour and human society, without taking into account what variously and rather loosely is called adaptiveness, purposiveness, goal-seeking and the like.

Indicating models to simulate such behaviour, 'equifinality', 'feedback control' and 'a design for a brain', three aspects of General Systems Theory, are worth mentioning. The tendency of first is towards a characteristic final state from different initial states and in different ways, based on dynamic interaction in an open system; the second, the homeostatic maintenance of a characteristic state or the seeking of a goal, is based on circular causal chains and mechanisms monitoring back information on deviations from the state to be maintained or the goal to be reached; and the last one, which was developed by Ashby and Bertalanffy (coincidentally with different lines of interest and conclusion), is about step functions (see also 'hierarchical function' of Pattee, 1970) defining a system, i.e. functions which jump into a new family of differential equations after a certain critical value is passed. Such a system adapting itself by, what biologist would call it, 'trial and error'. Teleological behaviour directed towards a characteristic final state or goal is not something off limits for natural science and an anthropomorphic misconception of processes which are undirected and accidental. Rather, it is a form of behaviour which can well be defined in scientific terms and for which the necessary conditions and possible mechanisms can be indicated (Bertalanffy, 1968). Another attempt of this thesis is to provide those necessary conditions and possible mechanisms through which a scientific definition of endogenous development is obtainable. In another word, this attempt should prove that the model of endogenous development, which has logical and philosophical basis, has also scientific explanations in relation to its behaviour. (See the discussion about The Model in Chapter Four: 4.B.)

3.B.2. Structuralism

The discourse about system theory reviewed different principles of this philosophy in different fields to be able to explain the difficulties associated with the explanations of open systems, living systems and natural processes similar to the intentional processes of human beings. To have a brief summary of these, it is worthwhile to remember that the idea of system theory

goes back to Leibnitz in 17th century. Gestalten was coined by Kohler and the others in 1927. Boulding pursued system philosophy in economy. Morgenstern coined game theory¹⁰ in 1947. Norbert Wiener in 1948 coined Cybernetics in relation with the technology in calculation machines. Shannon and Weaver in 1949 coined information theory which, in their sense, is based on the concept of information defined by and expression isomorphic to negative entropy of thermodynamics. But, the relationship between information and organization, information theory and thermodynamics, remains a major problem and its application to science have remained rather unconvincing (Gilbert, 1966). Boulding, Rapoport, Ackoff and the others have founded the movement of organicism in biology and the other fields of science in the beginning of this century. In sociology, Whitehead, Hegel and Lotka who view the world from organism point of view are the follower of systemic approach (Farshad, 1983).

The discourse has so far been considering the structure of systems in which, although things are going on, the system itself remains the same as time passes. From now on, the discussion will emphasise on systems that alter with the lapse of time (structure). Instead of the system question 'How can these observable be related in a statistical model?', structure answers the question 'What machine could generate this variety of observable?' Systemness is a property which is over and above a totality of lower-order entities and relations. Structure, on the other hand, is far less than a totality, being an abstract set of formal relations underlying the greater manifest richness of observable forms. Formal models for this general relationship, structure - transformation rule - observable form have been found in various branches of mathematics and logic (Hillier et al., 1972-73). Alexander et al. (1981, p. 20) refer to the importance of the structural entity and say: "True feelings arise only when you thoroughly and deeply recognize the structure of a situation that exists and you do exactly the right thing at the right moment to respond to that situation."¹¹ The result of such right feeling and acting is an environment which possesses what Alexander elsewhere calls the 'quality without name'.

¹⁰ Game Theory is a different approach but may be ranged among systems sciences because it is concerned with the behaviour of supposedly 'rational' players to obtain maximal gains and minimal losses by appropriate strategies against the other player (or nature). Hence, it concerns essentially a 'system' of antagonistic 'forces' with specifications. This theory was applied to war and politics; but one hardly feels that it has led to an improvement of political decisions and the state of the world (Von Neumann et al., 1947).

¹¹ The statement appeared in an interview in the fall 1981, issue of the Journal of Architectural Education.

3.B.2.1. Irreversible Time and Irreversible History

A field which is not an aggregation of elements, but an expression describing a set of relations between things governed by some overriding formative law, became the foundation of 'gestalt psychology', the first science of organisation in the human sphere. The gestalt psychologists were able to show that in important ways perception was indeed not additive, figures not the sum of their parts. Then system theory, as originally explored, was an attempt to utilise the both lines of thought: the thermodynamic analogy and the gestalt concept in constructing a scientific alternative to the biological theories of mechanism and vitalism. **Mechanism constructed the organism 'from the outside', whereas vitalism sought some extra principle at the centre of life. System theory sought to replace both concepts by theories based on the form of organization of living organism** (Farshad, 1983).

The application of the thermodynamic model to the study of organisms generated as a central theoretical question how the organisms, subject to a continuous programme of input, process, output, leading to its progressive replacement, nevertheless retains its internal coherence, unity and identity. What is it that stays the same when everything appears to change; or **what is the invariance under transformation of a particular set of phenomena?**

The thermodynamics which is a science of irreversible physical process, the idea of history as an irreversible process, and the theory of evolution which opened up the dimension of time in the biological science all participated in the concern for the irreversible process. Levi Strauss (1969) has extended the analogy to society. He contrasts the societies studied by anthropologists, which resembles clocks in that they do not have irreversible 'history', with modern 'historical' societies which like steam engines work on disequilibrium and differential energy and in which change, as a result, tends to be irreversible.

3.B.2.2. History of Science and Artificiality

With the hindsight afforded by Simon's (1969) formulation, Hillier et al. (1972-73) distinguished four stages in the history of science. The first stage in the history of science was the stage of the 'science of external nature' (Man was god like, the subject not the object of knowledge); and the second one, the stage of the 'sciences of Man' (although thereby became

an object of interest to science, he was still epistemologically and scientifically separate from the world he studied). The third in the history of science, according to where Man is located in the scientific scheme of things, was the stage of the 'Man-environment' paradigm. The following two lines of thought combine to give this stage:

1. 'knowledge' was possible since Man, by his nature, imposed certain basic categories on the universe - such as space, time and causality - and that these need not therefore be thought of as intrinsic properties of nature itself; and
2. 'evidence' for the influence of environment in the creation of different species.

In the fourth stage, that of 'sciences of artificial', instead of an abortive effort to link the study of Man through the study of nature, the sciences of the artificial are concerned with the artificial entities through which this relation is already mediated. Since this relation is already artificial, the scientific study of artifacts from tools to computers, from language to societies, from mythologies to cities becomes also the proper paradigm for the study of Man. The concept of structure as used increasingly in the non-natural science is now part of a fundamental concern in science for questions for **form, order, system and transformation**.

3.B.2.3. The Structural Models of Existent System Models

The structure models are attempts to reproduce the underlying invariance of some structural reality that already exists. It is concerned to make models of models that seem already to exist within the system studied. These are the models through which the system represents itself to itself, thereby both regulating and transforming itself (see Section 3.A, General Theoretical Framework of Attitudes in this chapter).

The whole purpose of the structural models is to offer a theory of difference and variety and this it does through theories of sameness. It proposes a deep abstract formation as the basis of richness and variety but its application returns it to the surface level, thereby losing variety and searching for a superficial sameness. **Some structuralists believe that it is only through transformation that variety is to be explained and the dimension of time recovered.** So,

time and change appear to be increasingly important dimensions in the study of any artificial domain [see also Chapter Four: Modelling (4.A)].

3.B.2.4. The Evolutionary Process and the Future

The theory of evolution in biology, first, discovers the source both of stability and change in the historical development of the system in question. Secondly, it shows how a self-regulating system can create its own regulators which are themselves continuously changing with the system. Thirdly, it is an interactionist theory in that it shows how the 'environment' and the 'organism' are bound together in the process of development and are mutually constructive. Fourthly, it may be seen as a form of hypothetico-deductive system in which random mutations are proposed as hypotheses to the system as it has then evolved and these are then evaluated by the environment (Hillier et al., 1972-73). **In other words, it suggests that the machine can learn and change its rules as well as reproduce itself and keep itself in a relatively ordered and stable state. This idea is contradictory to that of purposeful systems which are self-idealized and aim towards perfection by their will.**

Modern evolutionary (structure) is also the internal account of the transmission of stability and the generation of variety. So the theory of stability of any system in nature or the artificial, including the ability to generate change, must be in space-time not in three dimensional synchronous space. A situation of structural stability of any particular point in time may be understood, but it will not be explicable on the basis of the synchronous interaction of 'elements'. Beside those explanations cited before another definition refers to Smith (1968, p. 637) who sees all complex structure both as a record and a framework: "... The advancing interface leaves a pattern of structural perfection or imperfection which is both a record of historical events and a framework within future ones must occur." The evolutionary process in each phenomena is done by its structure. **This structure belongs to the phenomena and it is not possible to use it for the other one. It is continually in change and its results is manifested in the phenomena.**

3.B.2.5. Transformational Approach and Level of Theory

To be able to explain the evolutionary processes in living systems, there is a need for an

approach to pursue their structures which are to transform their entity while keeping their identity. In sociology, the synchronous dimension is associated with 'description' and the diachronous dimension with 'theory'. These concepts have resulted in considerable difficulties in the social sciences and few unambiguously successful examples of either strategy exist at a nontrivial level. The transformation approach rewrites both strategies at a fundamental level, locating both at the level of theory, and using the notion of 'generation' to show connections between different observable forms and to explain connections in terms of time sequences (Hillier et al., 1972-73). Showing the relation between the two levels or their sequences, the same source argued in page 27 that: "the whole question of 'causality' in its naïve form is made redundant in favour of relations which are pervasively generative and connected without being explicitly 'causal' at every level of resolution. The observation that in the last analysis in all systems some local determinism prevails is to say no more than no event is arbitrary and this is, of course, trivial." [See the discussion about cause and effect in Chapter Four: The Model (4.B) to find out that, despite this idea, it is a matter of significance.]

The trend towards 'phenomenological' approaches against the 'positivist' line of 'scientific' sociology is largely the result of failing to understand that science operates in a domain where consciousness and causality do not stand in paradoxical opposition to each other. Structuralism, which follows the dual pattern of theoretical science by investigating formalism and empirical realities in parallel, allies itself easily with science without implying the eventual subjection of the human race to robot-like control. On the contrary, its subject matter is the condition for human liberation. This point of view both corresponds to natural science and avoids applying concepts like 'causality'. The importation of such concepts into fields like sociology has led to endless debate between those who take the 'scientific' view and those who argue that this cannot account for consciousness and the individual. The trend towards 'phenomenological' approaches, against the 'positivist' line of 'scientific' sociology, is ascribed by Hillier et al. (1972-73) to be largely the result of failing to understand that science today operates in a domain where consciousness and causality do not stand in opposition to each other. **Hereby, it is conceivable to see production process, one of the endogenous development paradigms, as a transformational approach in artificial domain. The stimulus of production process paradigm (i.e. ultimate/final cause) provides both**

consciousness and causality in the process simultaneously which is the characteristic of symbolic structures in ideal-seeking systems. [See the main discussion in Chapter Four: The Model (4.B).]

3.B.2.6. Symbolic Systems and Transformation

The suggested concept of the individual as the source of society and its processes as symbolic system has no place in structuralism, since all structures - e.g. languages or cities - exist independent of any individual and are passed through time as culturally transmitted and transformed genotypes. The individual is not the prime mover and structures do not arise out of the interaction of individuals or their behaviour. The individual is relatively secondary to the processes by which societies transform their structural inheritance. But having abandoned the individual as the source of existing structures, s/he may be recovered as a unique and creative being, because s/he is the product of structures which exist independent of her/him. Each individual acquires genotypic cultural structure, but because the concept of 'rule governed creativity' describes human behaviour, the individual produces endless idiosyncratic transformations (Hillier et al., 1972-73). The same source later in page 73 described human beings as they are: "variety machines, not conditioned automata or mystical egos."

The individual is the source of the increase of variety, but s/he is also the product of the variety production of nature. S/he can produce variety by transformation differentiating structures because s/he herself/himself is linked back into universal history and s/he is a product of its morphology. Structuralism not only has a stake in the emergent synthetic paradigm of science; it is also itself the paradigm of creativity (Ibid.). But, what answer do structuralists have to the problem of the emergence of order, particularly that of creative, novel order? Atomists ascribe the emergence of order to some principle of interaction between the parts of which the entity is made. This hardly seems a promising approach to the complex organization of living systems, let alone their creative behaviour.

One of the most conflicts between Aristotle and Hippocrates, an atomist, was on this area. As Goodwin (1972) explains, Hippocrates contended that the general similarity of static and dynamic form between parents and offspring was due to the transmission of specific

substances from parental organs to the embryo. Hippocrates's position was clear: specific structure is transmitted by specific substances. The modern version of this theory is equally clear and unambiguous: the resemblance between parents and offspring arises in consequence of the transmission of specific genes from one generation to the next. But, Aristotle's objections to the atomist position are both simple and convincing. How, he asked, could a young man without a beard transmit to a son the substance required to grow a beard if that substance had to come from the beard itself? Or how could a man who had lost his hands in battle, say, nevertheless transmit the capacity to form hands in his offspring? Goodwin (1972) suggests that:

"The problem here is that between potential generative capacity and the realization of that potential. What substance can carry such potential? Aristotle contended that from substance alone one cannot make deductions about form; that knowing the composition of something is not sufficient to determine its structure. One must add to substance a principle of organization, which for Aristotle was a form or an idea, immanent in the process whereby order of a characteristic type emerges from disorder or lower order, as the embryo from the egg."

A genetic system involves the transmission from one generation to the next of something or another. Waddington (1969) calls it 'information' which has to be carried by some material structure. This sort of 'information' is purely genotypic. It is simply transmitted and itself does nothing to its surrounding so as to produce from them anything that can be regarded as a phenotype. But, how this information works in a living system comparable to biological ones?

3.B.2.7. Structural Information in Living Systems

Explaining the difference between General System Theory and Cybernetics, Bertalanffy (1968, p. 228) claims that the open system model is kinetic and cybernetic formulation is the dynamic interaction of its components and it does not talk about information. Cybernetics is based on feedback and information and by way of feedback information a desired value is maintained; so, it is not a metabolism. He then adds: "Except for the immediate satisfaction of biological needs Man lives in a world not of things but of symbols." Although Wiener (1948, p. 156)

agrees with the idea that life at the human and social level is too bounded up with symbolic systems, as Bertalanffy does, but he also asserts that: "the community consists of individuals with shifting relations in space and time and no permanent unbreakable physical connections. The secret is the intercommunication of its members. ... The community extends only so far as there extends an effectual transmission of information." [An emphasis should be given to the discussion about organisms (as purposive systems) and organizations (as purposeful systems). See (3.B.1.8.) in this section for more details.]

Biological theories have advanced beyond the simple finite informational concept of cybernetics towards 'structured information' or symbolic concepts whose models are to be found in structural linguistics, anthropology and mathematics. Moreover, it appears to be precisely through the transmission of such non-deterministic but 'unfoldable' symbolic structures that living organisms retain their stable forms yet participate in a gradual evolution. Leibniz's (1965) metaphor shows that preformationism could be improved by replacing the concept of a readymade miniature version (built environment) on innate structures (cognition) with the notion of a blueprint (comparable to the thesis's suggestion that of production process but in a certain area) that is a set of **instruction** to be carried out through a series of transformations, that never and nowhere is any perfect similarity to be found and therefore that intelligibility to science could be reconciled with the total existence of variety and differences.

In order to have a living system comparable to biological ones, Waddington (1969, p. 362) points to system theory by suggesting that "it has to include not only genetically transmissible 'information' but this information has to do something to its surrounding. We need transmissible instruction or programmes." Goodwin (1972) has suggested in a similar vein: "An organism inherits a fixed set of hypotheses and its life may be viewed as an unfolding of hypotheses consistent with these constraints." He also classifies hypotheses into 'good' hypotheses about this world which can be retained and stored and 'bad' ones which are discarded. Being concerned about different interpretations of teleology between systemic approaches and that of structuralism and similar to the classification of General System Theory about animates and inanimate (such as: state-maintaining; goal-seeking; multi-goal-

seeking; purposive; and purposeful systems), Structuralism has its own criteria (such as 'programmes') for distinguishing the living processes from nonliving processes. In this regard, Higgins (1970, p. 373) sees some of the biologists classification for living processes inadequate when he asserts: "The really distinctive thing about living processes is that they exhibit programmed activity while non-living processes do not. ... Feeding, replication, excretion, homeostasis, all these properties are exhibited by fire. It consumes fuel; it multiplies; it produces hard ashes; it is hard to blow out. But, it is not programmed."

Higgins (1970) believes that the programmed activity founded in nature is marked by at least one characteristic which has not yet been successfully copied by the engineers. In nature, the controlling programmes do not merely determine the way in which an organism reacts to its environment. They also control the actual construction of the organism and its replication including the replication of the programmes themselves. This is very important, because the small alterations which sometimes occur during replication lead to phenotypic¹² variations upon which natural selection can then operate. So he says, life is not merely 'programmed activity' but 'self-programmed' activity.

Waddington (1969) states that the genotypes of higher organisms contain enormous numbers of genes. Now, if a gene is considered to be as an instruction and some body thinks of the number of ways these instructions can be combined with one another and interact with the surroundings, the possible number of combinations is astronomical. In these terms, he suggests a multidimensional space with one dimension for each type of gene, so that a particular genotype can be represented as a single point within it. Now, from any particular genotype there eventually develops a corresponding phenotype which again we could locate as a point within a multidimensional phenotype space. However, between the genotype space and the phenotype space there is a whole series of processes in which the various genetic instruction interact with one another and interact also with the conditions of the environment in which the organism is developing. The system, therefore moves from the genetic space into the phenotype space through what Waddington calls it an 'epigenetic space', i.e. a space of

¹² The genotype - what is transmitted: the DNA - and the phenotype - what is produced when the genotype is used as instructions (Waddington, 1969).

developmental processes which are tending to push the developing processes in one direction or another. Now, not all these 'epigenetic operators' arise from the instructions in the genotype; some of them originate from the environment. He completes his suggestion by pointing to another stage which he named 'fitness'. This dimensional stage, he says, is the only space where natural selection can operate¹³.

3.B.2.8. Homeorhesis and Structural Stability

Another point which Waddington (1969) emphasises is that higher organisms usually exhibit a kind of stability. He has used the words canalization or 'homeorhesis' to describe this. The latter is a new word. It is related to the systemic expression homeostasis which is used in connection with systems which keep some variable at a stable value as time passes. A thermostat, for instance, is a device for producing homeostasis of temperature; or in the biological world it is well known that there is a homeostasis of the level of carbon dioxide in the blood which is adjusted by varying the rate of breathing, for instance, so that the concentration of dissolved gas remains constant. He uses the word homeorhesis when what is stabilized is not a constant value but is a particular course of change in time. If something happens to alter a homeorhetic system, the control mechanisms do not bring it back to where it was at the time the alteration occurred, but bring it back to where it would normally have got to at some later time. A homeorhetic system is rather like a stream running down the bottom of a valley, if a landslide occurs and pushes the stream off the valley bottom, it does not come back to the stream bed at the place where the diversion occurred, but some way farther down the slope. For more explaining the principle of homeorhesis Waddington adds:

"The general characteristics of the epigenetic space can be described by the instructions in the genotype which interact together to produce a system which moves along a stabilized time trajectory. Environmental influences may operate in such a way as to tend to push the system off the trajectory, but its tendency towards homeorhesis,

¹³ Waddington's proposal is somehow applicable in artificial domain or intentional processes, therefore it is similar to endogenous model which is propounded in this thesis, i.e. seeing genotype space similar to subjective cause; epigenetic space to objective cause; phenotype space to formal cause; and fitness space is similar to end-projects when they are in the competition in market selection causing by supply-demand paradigm (see Chapter Four: 4.B for more details). The missing element in this model, comparing with the Endogenous Development Model, would be the final/ultimate cause which makes endogenous systems purposeful.

will tend to bring the system back on to the normal path again."

So, it appears to be precisely through the transmission of such non-deterministic but 'unfoldable' symbolic structures that living organisms retain their stable forms yet participate in a gradual evolution.

The gestalt psychologists could show that figures are not the sums of their parts. Because, in important ways perception was not indeed additive. For example, the composition of four triangles might result in five triangles (Figure 3.B.6). System theory used the thermodynamic analogy and the gestalt concept in constructing a scientific alternative to the biological theories of mechanism and vitalism. Gestalt theory may also help to achieve better understanding of the principle of homeorhesis in biology. It may help to explain the negative forces which push society towards affliction or positive forces which pull it collectively towards productivity and development (see Figure 3.B.6). Participating in a gradual cultural evolution and economic progression, the symbolic structure of society can retain its stable form only in a coherent context. This invisible entity¹⁴, which is more than the sums of the individuals, is also responsible for the quality of changes in productive ways. It may be seen as cultural identity which is different from the feedback control whose nature is that of information (see Chapter Four: 4.B for more explanation about production process). These exceptional dynamical constraints or controls which have no clear physical explanation (i.e. no currently conceivable 'direct interaction' interpretation) have been referred to by Pattee (in Waddington, 1970, p. 120) who believes will help to distinguish life from inanimate matter. He says: "We will not find such an explanation by inventing new words for our descriptions of each level of hierarchical control. Instead we will have to learn how collection of matter produces their own internal descriptions."

¹⁴ It is, perhaps, similar to the 'quality without name' of Alexander (1981).

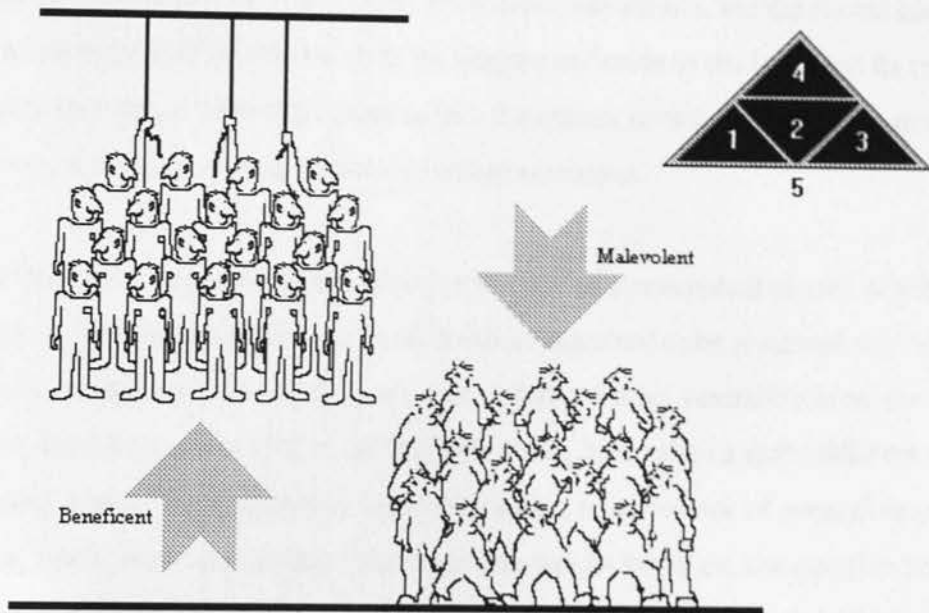


Figure 3.B.6 Invisible forms and forces of a system which are not the sums of its parts
 The usage of Gestalt theory in defining the invisible forms and forces of a system.
 Source: the author

3.B.2.9. The Collective Action of a Group and Principle of Hierarchy

In society, a set of laws is legislated by the collective action of the group but applied to individuals of the group; or in the development of the organism, the collective interactions of neighbouring cells control the growth or genetic expression of an individual cell. Recognizing the essential characteristic of hierarchical organization, Pattee (in Waddington, 1970, pp. 124 -125) indicates that the collective constrains which affect the individuals elements always appear to produce some 'integrated functions' of the collection. In other words and out of the innumerable collective interactions of subunits which constrain the motions of individual subunits, some coherent activities are recognizable. In common language, hierarchical constraints produce specific actions or are designed for some purposes. Then he suggests three conditions for a hierarchy :

- autonomy; (that is a closed physical system.)
- elements in the system; (which obey laws of physics.) and
- collections of elements. (These constrain individual elements.)

Talking about 'structural hierarchies' and 'functional hierarchies', the same source asserts that there are structural hierarchies in all nature, both living and lifeless, but functional hierarchies are seen as essential characteristic of life from enzyme molecule to the brain and its creations. He suggests that 'being hierarchic' requires that the system controls its dynamics through an internal record which has some aspects of '**self-observation**'.

The basic strategy of aggregating behaviour statistically as a conceptual model, which relates the aspects of intelligence together and which can be expected to be progressively refined as the research programme develops, bears a remarkably formal resemblance to the 'system approach'. Researchers like Piaget, on the other hand, have taken a quite different view of 'intelligence'. Instead of aggregating behaviour within a framework of general assumption about what 'intelligence' is and what behaviour indicates its presence, the question has been: what kind of structure must exist in the operation of cognition for such behaviour to be possible? Piaget used logic literally as models for his theories. The models that Piaget makes are simulations of structures which must in some sense already exist in the child for those behaviours to be possible. On the other hand, the structure that Chomsky proposes is not simply a convention defined for the scientist's purposes from outside the system. Hillier et al. (1972-73) consider it as an attempt to make a model of those structures that must already exist, for example, within a language in order for it to be possible for that language to be used in a rule-governed creative way.

Chomsky's strategy corresponds with recent suggestion in theoretical biology. For example, Pattee (in Waddington, 1970) distinguishes life as different phenomenon from inanimate matter by exceptional dynamical constraints or controls which have no clear physical explanation (i.e. no currently conceivable 'direct interaction' interpretation). Therefore, structural models are attempts to reproduce the underlying invariance of some structured reality that already exists. It is concerned to make models of models that seem already to exist within the system studied.

3.B.2.9.1. The Applications of Structuralism in Artificial Domain

The concept of structure as used increasingly in the non-natural science is part of a

fundamental and pervasive concern in science for questions for **form, order, system and transformation**. For instance, language became an object of empirical study and this study was naturally carried out from a historical point of view. Boole (1854, p. 25) has tried to show that language, with all its variability, expresses certain underlying structural laws of thought. He saw language as a device for carrying out reasoning. So, he claimed that "in studying the laws of signs we are in fact studying the manifested laws of reasoning." The structure of language emerges from the subject and constitutes the externalisation of the structure of the subject's thought. Hillier et al. (1972-73) agree that the historical approach cannot explain language in the way that it is able to explain organic life. As a whole, the semiological science resist history and the diachronic perspective as universal explanations. The same source indicates that **in structuralist methodology, the foundation are laid in the semiological synthesis of mathematics, logic and language**.

De Saussure (1966) proposes kinds of 'elements' in language which are basically relationship. He denies the existence of concrete 'elements' in language or any other system. He proposes an abstraction as the 'unit' and a formal structure as the source of systemness. This formulation easily contains the existence of higher-order properties for the system as a whole which do not emerge from the interaction of the elements. Therefore, systemness of any natural, social or environmental whole cannot arise only from the interaction of units within that system. Systemness arise from the transformational history of the system and its units regulated by the system itself as it evolves. This is the fundamental point for Hillier et al. (1972-73) who claim that any system must be explained in terms of its history as it transmitted through the structure of its units and regulated by the evolving systemic regulators. De Saussure (1966, p. 115) shows that the content of language is only fixed by the concurrence of everything that exist outside. He says: "Being part of a system, it is endowed not only with signification but also with a value which is something quite different." De Saussure (1966, p. 104) denies the existence of concrete 'elements' in language or any other system:

"The linguistic entity only exists through the association of the signifier and signified. Instead of a concrete entity we are faced with a mere abstraction. ... succession of sounds is linguistic only if it supports an idea. Language does not offer itself as a set

of pre-delimited signs that need only be studied according to their meaning and arrangement. ... Just as a game of chess is entirely in the combination of the different chess pieces, language is characterised as a system based entirely on the opposition of its concrete units. ... Language has the strange, striking characteristic of not having entities that are perceptible at the outside."

Since throughout the domains of the artificial are structures which are used in everything life, but not understood in any formal sense by the users, structuralism proposes in essence the reconstruction of what is already known. Therefore by applying this proposal in a broader domain, the author would like to claim that **built environment as an abstract entity does exist through the association of the users and products and is not perceptible at the outside of the space between them.**

It is through the bond between structure and transformation and the relation of both to the surface appearance of things that the link between evolutionary perspectives in biology and structuralism in the sciences of the artificial can be made. The discovery that the inner architecture of form was not given in its surface appearance and its explanation required concepts of function, transformational time and the mathematical transformations. 'Structure' is said to be in all cases some set of logic - mathematical relations that underlay morphological variety and give rise to properties of systemness.

Structuralism has only recently begun to be explored in environmental sciences, but as elsewhere, its first outcome is reformulation at a theoretical level. In this case, the entire research strategy based on opposing variable subjects to variable environments and searching for systematic patterns in the relationship - structure is ignored on both sides - may be redefined in terms of the language-speech distinction referred to by Hillier et al. (1972-73). **The formal equivalent to 'language' as a structural whole is the morphology of physical environment as a social manifestation (plan). The equivalent to speech is the individual or group transformation and elaboration of that structure (strategy). The latter is almost certainly governed by gradually changing codes.**

In the process of constructing the language, which is introduced as the structure of environment, the elements and the interactions of them is one of the necessities. In fact, language is the manifestation of these interactions. This way will clarify a kind of language or a kind of environment. Therefore, it is possible to say that these interactions create the structure of one society:

- a) relationship between element and itself;
- b) relationship between element and the others; and
- c) relationship between element and the nature.

Therefore, if one of the structural elements did not have any relationship with the other members, it would not have any identity and would not have any form of contribution to the structure of the subject indeed. Consequently, kinds of relation of each element with itself, with the other members and with the environment itself, **its achievement will manifest, experiment, exceed and develop**. This communication action should occur during the process in order to bring these changes from mind to observe and from mental to material. If there was not any communication, transferring would not occur and process would not be controlled and checked, hence there would not be any regulation period.

The process will be more complicated, if the number of structural elements is increased. In fact, any process is identified by its number of elements and also by its capacity of elements' transformed information. It has been also mentioned by some commentators that in organic growth situations, the mechanism of using the natural patterns in artificial domain is automated, but in unnatural situations and disasters (wars, attacks, diseases, weaknesses, recompensing, ...) this character faces danger and the complication of unbalanced character of this mechanism occurs in both system and structure (see Appendix One: Section (e) for the discussion about Hasty Development in Harsh Situation.). The rate of growth of artificial in different societies is also different and that is because of their understanding of definitions of system and structure and also because of their interfering in the rules of these concepts.

The traditional approach to living space modelling, which aims to relate patterns of activity

to patterns of space, gives way to an account of the generation of space by society and of its subsequent transformation and elaboration. A continuous process of transformation, including both designers and users, is substituted for the implicit opposition within current paradigms of the design of space and its use. Both can be located in a continuous transformational perspective. The approach which has called 'socio-spatial morphology' aims initially to account for certain generic forms of space as expression of social processes. These elementary forms are structures. These elementary structures, since they embody semantics, contain within themselves the rules for higher-order aggregations which are likely to be established. These characteristic patterns by which the internal structure of lower-order forms are connected to higher-order structures are called by Hillier et al. (1972-73) 'aggregation modes'.

These is a central focus of the above theory since there are relatively few aggregation modes for collection of buildings which define the characteristic forms of built environment and are intuitively recognised and used in certain ways. The aggregation modes give rise, by elaboration of the defined spaces, to an equally limited number of 'structurally stable morphs' where structural stability is accounted for both in terms of physical and social factors and in terms of the evolution of the spaces. The same source counts the more interesting forms of structural stability in socio-spatial morphs as those where elaboration has led to a property of denseness and thus the metric properties¹⁵ of the space also contribute to structural stability.

Conclusion of System View & Structuralism

Time itself is cyclic and by of its returning seasons we review the progress and growth of our understanding. The universe and Man's consciousness (the macrocosm and the microcosm) consist in a continuum and a dynamic whole. Within all the universal continuum, we are limited by space-time to successive and analytic observation of its parts. Chemical changes, for example, have been occurring in a millionth of a second, others occupy many years and now it is possible to look briefly at chemical change over two billion years; not any single change but the trend of chemistry over evolutionary time. One such trend has already been

¹⁵ Further exploration of these properties may require more information in details about aggregation and segregation and their roles in 'Space Syntax' theory which is a methodology coined by Hillier and his colleagues.

encountered and has been our guiding principle that dictated by the second law of thermodynamics. But, there is another trend which seems diametrically opposed to this: the creation and evolution of life. This is a long story of increasing entropy from the void of the first day to the supreme organization of Man himself. Even beyond this the trend continues as Man progresses towards a unity of nations.

The discourse reviewed that it is almost conceivable to consider a scientific understanding of human society and its laws in a somewhat modest way. Such knowledge can teach us not only what human behaviour and society have in common with other organizations, but also what is their uniqueness. Here, the main doctrine will be: Man is not only a political animal; he is, before and above all, an individual. The real values of humanity are not those which it shares with biological entities, the function of an organism or a community of animals, but those which stem from the individual mind. Human society is not a community of ants or termites governed only by inherited instinct and controlled by the laws of the superordinate whole; it is based upon the achievements of the individual and is doomed if the individual is made a mess in the social productive forces in building the environment.

For the 'general system' model to serve as a basis for a theory of built environment, the system has to manifest its systemness in synchronous three-dimensional space, not in space time, since system theory does not regard the time dimension as a source of systemness itself, but as the source of state changes. To introduce time into the theory of systemness itself requires the transmission of internal structure, so there would even be a hope that theories for artificial systems, e.g. cities, should not just take the form proposed by General System Theory. The possible approaches to systemness are identified by:

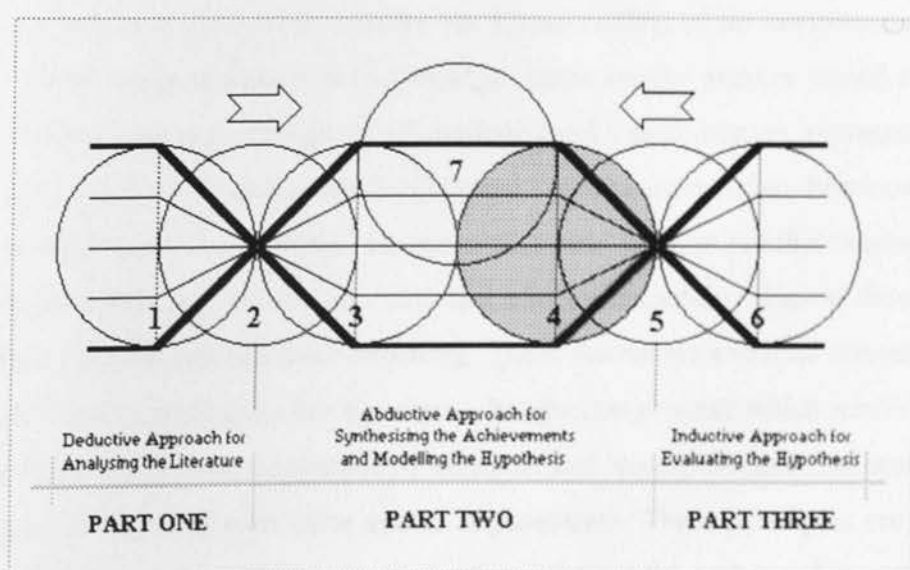
1. the 'direct interaction' or 'general system' model;
2. the 'finite information' or 'cybernetic' model; and
3. the 'non-finite structured information' model of theoretical biology.

Translate into the situation of an environmental designer, structuralism means simply that in order to project her/his imagination into the future with any hope of successful outcomes s/he

must study how the structure of the past has produced the structure of the present. Like biology, it is necessary to learn to see people as variety producing systems, the structure of which is not in their power to change, but whose future developmental pathway may in some sense be modified or even altered. On the other hand, the evolutionary paradigm of modern science requires Man to see himself as a designer in the level of purposeful systems seeking his ideals rather than as automaton programmed by the environment or by its genetic inheritance. The designer transmits a half-understood structural past into a different future whose frame can be designed and this is the paradigm for human behaviour and the concern of the model of endogenous development.

CHAPTER FOUR

TOWARDS A MODEL OF ENDOGENOUS DEVELOPMENT



INTRODUCTION TO CHAPTER FOUR

Chapter Four brings together the intellectual resources of Part One and mediates these through the theoretical treatment realised in Part Two. The intention is to arrive at a hypothetical tool for interpreting real-life data which will be tested and supported in an actual situation in Part Three. It is subdivided into two sections: Modelling and The Model. These allow a progression from a general study of model forms and structures to the crystallisation of a definitive model that suits the use perceived by the author.

A 'model', in its widest sense, is a system for the interpretation, simplification and expansion of any thought. More specifically to this research, models are techniques whereby human ingenuity arranges variables pertinent to investigation to express their functionality within an overall phenomenon. Models must be constructed on an anticipation of the interrelations of the data and the desire to express these in the clearest manner. The first section, Modelling, studies these in order to enable the author to design a highly particularised model. The second section will go on to employ two of these techniques, i.e. 'mapping the consequences' and 'grids', to describe complex paradigms inherent within the model of endogenous development.

At this juncture, it is essential to consider the human reading of the environment through signs, symbols, needs and collective knowledge. These are the primary stimuli to people-centred development and, through social continuity and transformation, represent the true context and indicator of endogenous development - growth from within. Previous chapters covered scientific issues that explained changes and control systems and this chapter is about philosophical issues that introduced cause and effect relationships, logical thoughts that formulated inductive and deductive reasoning. These discourses will now converge into a single model that encapsulates two paradigms; 'production process' which relates cause to effect, the diachronous to the synchronous dimensions; and 'supply-demand', the synchronous matching of products to each other and to requirements. These paradigms are mutually supportive and the outcome of this interaction is the evolution of thoughts and the progression of products in response to people's needs and wants.

4.A

MODELLING

Introduction to Modelling

4.A.1. **Different Kinds of Model**

4.A.1.1. Structure: Components and Background Relationships

4.A.1.2. Process and the Transient Relationships

4.A.2. **Hierarchies and the Organization of Complex Entities**

4.A.3. **Other Types of Order and Modelling**

4.A.3.1. Different Types of Grid

Conclusion of Modelling

Introduction to Modelling

Information is usually used in solving problems of an adaptive-learning control system when the intention is to make decision (see Figure 3.B.4 in Chapter Three). **Decision making is a process which converts information into instructions.** Instructions are messages that are intended to affect the behaviour of the systems which are controlled in a way that improves its performance. Decision making also requires thought and thought requires mental manipulation of a representation, a concept or a model, of what we are going to decide about. Through such representations a decision maker can determine what alternatives are available to her/him and what the consequences of each are likely to be.

One of the intellectual legacies of the Systems Age is the ability to formulate explicit, quantitative and accurate representations of problem situations. These representations are usually expressed in symbolic form, hence they are called by Ackoff (1974) 'symbolic models'. He argues that the use of symbolic models to represents things rather than problems is not a scientific achievement for solving the problems. He suggests two parts for a symbolic model of a problem. The first is an equation that relates a measure of system performance to those aspects of the problem situation, both controlled and uncontrolled, that can affect it. The performance equation has the following form:

$$\text{Performance of the System} = \text{A Specified Relationship between} \begin{matrix} \text{Controlled Variables} \\ \& \\ \text{Uncontrolled Variables} \end{matrix}$$

Performance of the system may include such quantities as the number of houses built per year, expected life, cost of project or net profit (end-projects). Controlled variables may include such factors as the number of people involved, the amounts of money spend on material, the kind of material used and the location and size of a facility to be built. Uncontrolled variables may include such things as weather, national economic conditions, the cost of labour, competitive behaviour and consumer performances. The second part of the model expresses the limits within which each of the controlled variables can be manipulated. Therefore, the solution to a modelled problem consists of those values of the controlled variables that, within the specified constraints and under the relevant uncontrolled conditions, yield the best

performance of the system. A solution that does so is said by the same source to be 'optimal'.

Many people find that it is often useful and enlightening to have visual illustrations of these models. This section is, therefore, provided with a number of diagrams and figures. **These are not intended to express facts about quantities of things like the usual graphs one sees in scientific books. They are strictly illustrations of ideas and their purpose is to stimulate one's imagination to seize the point of what an idea is about.** They are not drawn in the way that has been conventional for illustrations in technical or most other intellectual books, but have been performed to combine the intellectual capacity to grasp the ideas or the complex things with the visual imagination to find a way of symbolizing them.

To find a way of symbolizing the visual imaginations of the ideas or complex things, there is a need to explain the word 'complexity' first. Many try to give a definition of 'complexity' which is meaningful enough to help measuring exactly how complex a system is. Apparently, it is something to do with the number of elements which can be separately identified in the system and with the number of ways in which they are related; but it is often a matter of choice how many elements one wishes to distinguish and how far s/he wants to follow up the expansions of their relationships and interconnections (Waddington, 1977). Furthermore, **the increase in the complexity of relations is the combinations of instructions instead of relations between things.** For instance, there are only a very small number of rules for moves which can be made in chess when these few rules are carried out alternately by two players. This is the result of different positions of the pieces of the board which is enormous.

There exists also a limitation of the capacity of the human brain in dealing with the complex world. Without the assistance of the symbolic concepts, a person would be reduced either to taking decision in the light of only seven or eight particular facts or to turning the whole things over to a computer which would be programmed to process the complex according to a predetermined relationship which presupposes a solution. Therefore, the attempts to deal with complex situations have to be carried out within the limitations of the brain. These limitations are rather severe. Because, the number of items it can consider simultaneously is tiny. For example, if it is subject to several incoming stimuli to various sense organs, in

general it can discriminate and recognize only about seven or eight at once. This is a remarkably small 'channel capacity' to use the electrical engineers' term (Ibid.).

The same source defines these simultaneous items and says that these seven or eight ideas, that can be brought into immediate consciousness, need not be items of specific detailed information. Some of them may be complex ideas or theories synthesizing into a single concept, a mass of minute details. **The process of formulating theoretical concepts is the only device to deal with the highly complex world.**

It is not possible to give anything like a complete or accurate picture of the complexity of the world which has been tried with the imperfect instructions which can be estimated only indirectly by figures and shapes which give indications of trends rather than anything more precise. It is also obvious that no single person 'knows' all of the available information or even has access to it, but s/he may be able to find any particular item, if s/he search enough for it. The consequence of this may be that it becomes easier to rediscover a fact rather than to find out whether somebody else has already discovered and described it. However, it is optimistic to think that anyone really knows how to deal with the situation in the complex world. To be able to do this, Waddington (1977) suggests some mix of the followings:

- a) teaching general principles; (which will go out of date only slowly.)
- b) teaching methods for finding out rapidly and fairly comprehensively the up-to-date factual information; [which will put flesh on these bare bones at any time when it becomes necessary to apply the (c) and (d).]
- c) teaching methods of classifying information into some hierarchies; (so that the items relevant to a particular context can be rapidly filtered out.) and
- d) instilling motivation for continuing self-education after the period of formal education has ceased.

But, what this mix should be and how to achieve these ends still remain to be worked out. Therefore, an attempt has been made to define the ways one classifies information into some hierarchies (models) and their limitations of describing the situations. In this regard, Carter et al. (1984) indicate that a good systemic model describes a situation to its participants in such a way that:

- a) they feel that it makes sense of their experience of the situation and its context;
- b) they can commit themselves to it as a framework around which to coordinate their actions; and
- c) when they do so they find it useful so that their expectations of it are appropriate and they are unlikely to be surprised by unexpected outcomes.

4.A.1. Different Kinds of Model

Physical sciences judge 'truth' or 'validity' by how well a descriptive model can predict how things will turn out under a wide range of conditions on different occasions and for different observers. In the social sciences, situations are usually so complex and variable that they never repeat exactly. Because people are 'free' beings, they can choose (within limits) what they do; so, they can often prevent a predicted outcome happening if they want to, i.e. they can undermine predictions. In applied social sciences, as when an analyst applies systems of ideas to organisational analysis, there are additional problems due to deadlines and limited resources and the central involvement of both client and analyst. So, unambiguous objective validity, as understood by the physical sciences, is impossible (Carter et al., 1984).

However in both situations, a model is usually used to yield predicted hypotheses. The test of the consistency or inconsistency of the predictions with events can be used to modify the theory and the selection of facts. The predictions themselves may, of course, alter some of the facts. Barratt Brown (1972) claims that the usefulness of the model depends on its fruitfulness in yielding hypotheses which prove to be consistent with events.

Among different kinds of model, systemic models are most popular among the built environment professionals. Carter et al. (1984) classify systemic models into a 'causal network model' and a 'purposive model'. The 'causal network' model emphasises systematic factors (opportunities which may be created by supply-demand relationship in the model of endogenous development whose function is in surface-structure of the system) but underplays individual choice. The 'purposive' model emphasises the process of pursuing a target. The 'purposeful' model emphasises the act of choice (similar to design process which is a part of the production process paradigm and its function is in deep-structure of the system¹). The emphasis a person chooses depends on her/his beliefs and values. If s/he wants to regard human behaviour as economically and socially determined, s/he may probably prefer the 'causal net' rather than the 'purposeful' model. There is also an argue that it may be as much a matter of respect and affection as of intellectual argument.

There is also a precise definition of the meaning of structure and process in system view. In system terms, the 'structure' of a situation tends to include the aspects that support and contain the situation, but also those aspects that constrain and limit it. For example in theatre, there is usually a fixed setting (scenery, furniture, cast-list and costumes) and a set of relatively fixed background relationships that show the previous history before the play began - the wife has a husband, the house belongs to somebody, the key fits the lock, the river marks the boundary, etc. Against this structural background, the theatrical action takes place - transient interchanges, transient events, transient interrelations as the story unfolds and the characters and relationships develop. In system terms, this is the 'process' of a situation which often includes those aspects that promote change and growth (the changing pressures, the emotional charges, the energy and motivation) but also the aspects that promote fragmentation and defensiveness such as the conflicts, the explosions and the collapses (Ibid). This definition of structure and process is more likely to be different from those which have been discussed in the previous chapter (structuralism), when the trend of the discourse went towards the identification of living systems and ideal-seeking systems. This difference will be discussed more precisely in the next section of this chapter.

¹ See Chapter Four: The Model (4.B).

The difference between structure and process in systemic approach is similar to the difference between nouns and verbs. In the phrase 'architect builds houses', architect and the houses are structure, 'building' is process. But, verbs can become nouns. If 'architect is the builder of the houses', 'the builder' is now a noun - process has become structure. So, there is a lot of flexibility about which parts are noun-like structures and which are verb-like processes. It needs to be clear that which are using as which; there is also a need for its consistency. Both structure and process should be used together - a description will not work if it is all nouns or all verbs (Ibid.).

The same source continues that structure and process are not just convenient descriptive categories. The relationship between them often has a remarkable effect on the 'climate' of a situation and since it involves the balance between the forces for stability and the forces for change it may determine the direction that event may take. Moreover, relationships can be either structure or process depending on whether they are stable or transient. Two items have 'a relationship' if it makes a significant difference to one of them if the other is removed. For instance, if one firm goes out of business and this affects another firm clearly the two firms 'had a relationship' (Figure 4.A.1). If one was the subsidiary of the other, this was probably a 'structural relationship'. If it is just that one had sold something to the other, but had not yet been paid, this is probably a 'process relationship'.

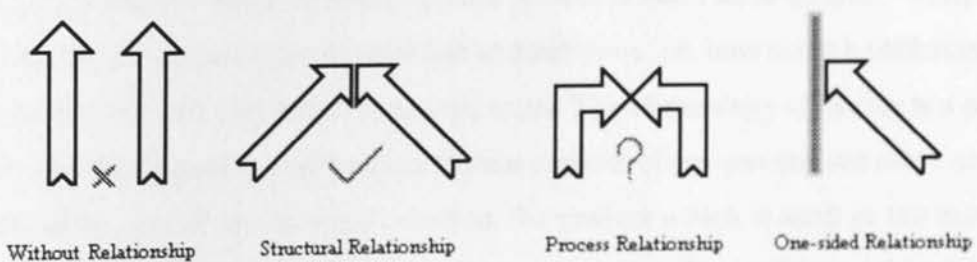


Figure 4.A.1 The structural and process relationships between two items
[adapted to Carter et al. (1984)]
Source: the author

4.A.1.1. Structure: Components and Background Relationships

Components are anything that people in the situation regard as physical or abstract entities (structural features they treat in a noun-like way), **features that exist rather than happen**.

For instance, any of the following can be treated as 'components': train; litter; transport police; pigeon; safety; newsagent; technical skill; and etc. Some components can include others - 'station' includes 'concourse' which includes 'ticket barrier'. 'Working conditions' include 'wage differentials' and 'safety'. In other words, **there is a hierarchy of levels of components**. Background relationships are the relatively unchanging and stable relationships which the same source categorises them as:

- a) logical and causal relationship; (when 'a' is either necessary for, or has influence over, or is connected with, or is the controller of 'b'.)
- b) inclusion and membership relationship; (when 'a' is either part of, or is an aspect of, or is a member of, or belongs to, or overlaps with, or consists solely of, or is of a higher order than, or is contained within 'b'.) and
- c) personal and contractual relationship. (This is when 'a' either does not like, or domineers over, or is the mate of, or has a commitment to, or is the supplier of 'b'.)

4.A.1.2. Process and the Transient Relationships

While it is not too hard to represent the fixed structure of a situation as fixed lines on a diagram, capturing the changing and temporary process is much more difficult - many of the really transient processes are bound to be lost in description, i.e. how much a performer adds to the bare words of a play script or a music score. **The chronology of events is a part of the process. The inputs to and outputs from a structural component are often usefully thought of as part of the 'process', such as the process which is used in the model of endogenous development, i.e. the production process paradigm whose real input is the needs and desires of people rather than the knowledge and the expertise of the professionals. Process can be represented in an even purer form by showing the flows between functions rather than components, e.g. between: arrival, finding information and waiting rather than: foyer, enquiry desk, café, etc.**

An example of the design problems that affected the new rail system for the San Francisco

area is worth mentioning to show another aspect of process which is 'mapping of consequences'. This example is an analysis of some unexpected consequences of adopting a particular broad policy which is illustrated in Figure 4.A.2. The complexity of this kind of process is from one hand associated with the aggregation of similar functions in one level and from the other, the relation between different levels is based on a hierarchical order, i.e. the end of one level is usually the start of the other (sequence of the stages).

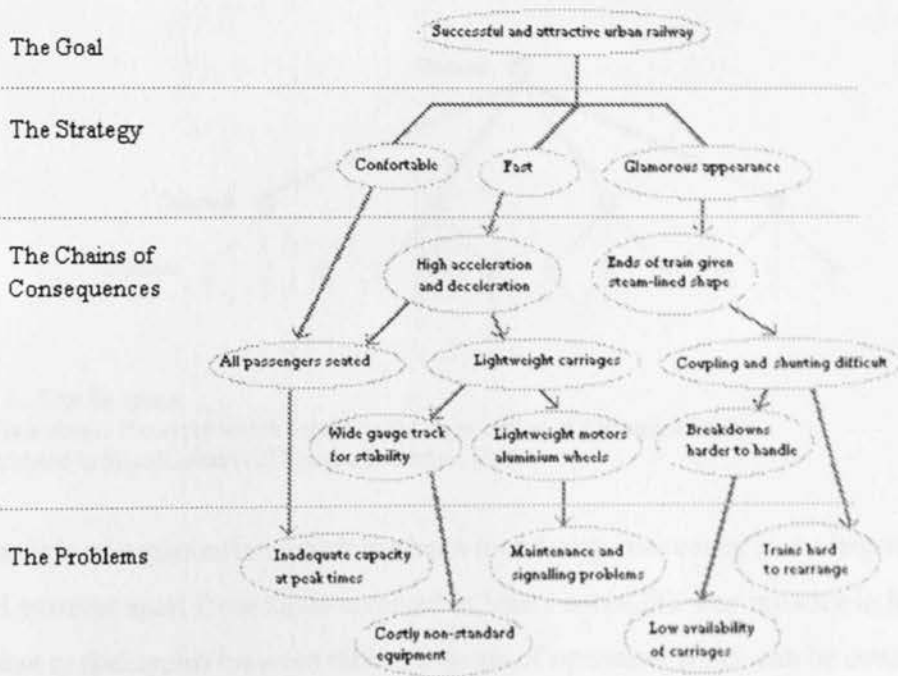


Figure 4.A.2 'Mapping the Consequences' of design problems in that affected rail system for San Francisco

Source: Carter et al. (1984)

After a brief discussion about different kinds of model and the complexities associated with the relationships between their components and to be able to illustrate them and the relationships embodied in a complex situation (system) by a model, there is a need for knowing more about the shapes and orders. Perhaps the simplest examples of complex things which one comes across are complex shapes; in them nothing is changing and nothing is engaged in active interaction with anything else. Even so, they are quite difficult to grasp or describe. Some of them have been classified in Appendix One: Section (k) which is about Complex Shapes.

4.A.2. Hierarchies and the Organization of Complex Entities

The concept of a hierarchy is a very basic one in considering the organization of a complex entity. Its use is usually common in a social set up when there is a tendency to find out the role of the participant and the class of the people. And when an attempt is given to organize a social system of another kind, perhaps more democratic, there is often a great tendency for it gradually to turn itself into a hierarchical system of the traditional kind in which a few people boss the rest (Figure 4.A.3).

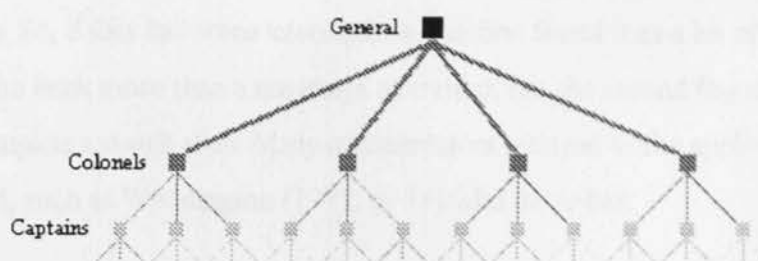


Figure 4.A.3 Tree Diagram

It is a simple hierarchy which considers the organization of a complex entity.
[adapted to Waddington (1977) and Alexander (1966)]

It is a principle of organization which has been found very convenient in dealing with many organized systems apart from those involved in Man's social life. For instance in biology, it is convenient to distinguish between different levels of operation which can be considered as levels in a hierarchical system, e.g. the ecological level which includes all the living things and the natural resources available in a certain region; the level of the individual animal, e.g. a rabbit; the level of its organs, its liver, kidneys and so on; the cellular level; and then several different sub-cellular levels (Waddington, 1977).

It should be remembered that hierarchies are only descriptions of structure; they do not imply that 'lower levels' in the hierarchy are 'lower' in all the possible senses of that word. For instance, apparently some special functions may be delegated to members of a fairly low level in the hierarchy, e.g. to a colonel or a captain in an army, and he may then have full responsibility for that particular task. Again, members of a low level may carry out functions on which all the higher levels are quite dependent. The whole subject of how a hierarchically organized human association works (what is its strategy, what is its tactics and who gives

orders about what?) is one of the major preoccupations of Management Science (Ibid.).

Simon (1969) has brought one of the reasons to describe why organization into a hierarchy is both so useful and so usual; he puts it in a parable about two watchmakers both of whom produced very fine and accurate watches. One had designed his watches on a hierarchical scheme; he put together ten components into a stable subassembly which he could leave aside for a time; then he could put together ten different subassemblies into a major part; and finally ten major parts into the whole watch. The other one had to assemble thousand parts of a watch all at once. So, if they had some interruptions, the first found it as a bit of nuisance, but they never set him back more than a ten-stage operation; but the second found it practically impossible to complete a watch at all. Many commentators referred to the application of them in modern world, such as Waddington (1977, p. 51) who describes:

"This is no more than the rationale on which Henry Ford 1 made his fortune and saddled the modern world with the materially enriching but humanly brutalizing hierarchically organized assembly lines of mass production. It is a method that works; but, its price is a bit stiffer than we might guess at first sight."²

4.A.3. Other Types of Order and Modelling

Another way to exhibit the relations in a visual form is to fit them into a 'tree diagram' or 'dendrogram'. This has the effect of showing the structure as a modified hierarchy with some gaps and jumps. To do this, five components are considered which are written in a line at the bottom (i.e. a, b, c, d and e) and the appropriate ones are connected at higher levels (e.g. b and d) indicating interactions of strengths 4, 3, 2 and 1. The diagram would be simpler if a suitable arrangement into which to place the elements in the lowest line is found. It is usually to start by grouping together those which interact most strongly (Figure 4.A.4). There are many types of organization in which the component elementary units are not related to one another in a strictly hierarchical order, but in some more complicated ways. The structure cannot be represented by a simple hierarchical tree diagram. There are also some other ways of making diagrams of these structures which are discussed in the followings. These are either

² See also the Conclusion of Design Process (2.B) in Chapter Two for more details about Fordism.

representation of the real situations or devices for making the consideration of the complexities of the social organizations easier and to make the study organized.

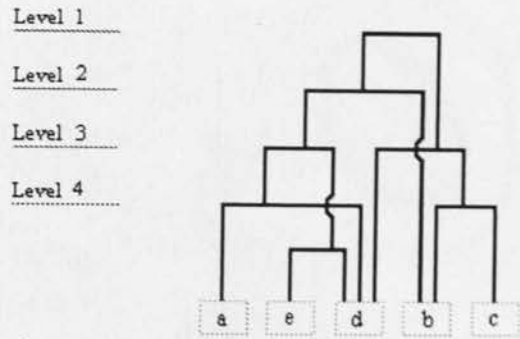


Figure 4.A.4 Tree Diagram or Dendrogram
This shows the structure as a modified hierarchy [adapted to Alexander (1966); and Waddington (1977)]
Source: the author

The 'digraph convention' is good for showing the network of relationships that are all at one level of analysis or are in a fully defined hierarchy. But, it is not good at showing that the level of unemployment is different in two areas that this has general effects, but that it is hard to be sure of its particular effects on different individuals in those areas (Figure 4.A.5).

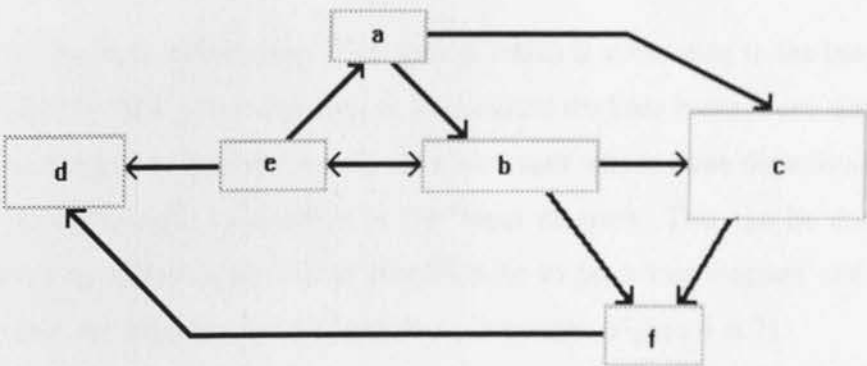


Figure 4.A.5 The Box and Arrow Network (Digraph) Convention
Source: the author

Another way of drawing exactly the same information as there is in a 'tree diagram' is to make what is called a 'Venn diagram'. In this way, components are written down not in a line but in some suitable arrangement on the page. Then outlines are drawn enclosing the ones which interact together; the heaviness of the line corresponding to the strength of the interaction, i.e. the 'overlapping and concentric areas' (Venn) convention: so there is, often, opportunity to

choose the most convenient mixture for our diagram (Figure 4.A.6).

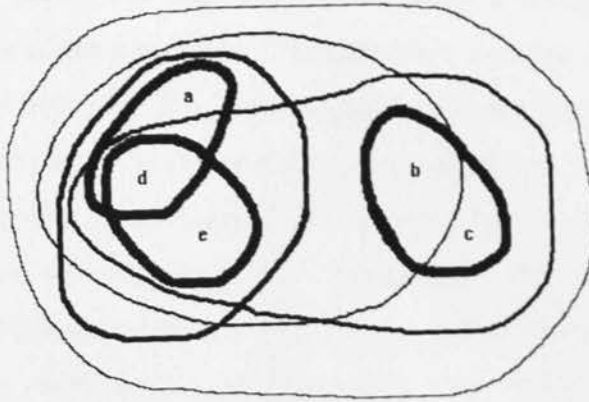


Figure 4.A.6 Venn Diagram or Semi-lattice

This has suitable arrangement showing the heaviness of lines corresponding to the strength of the interactions.

Source: Alexander (1966); and Waddington (1977)

These methods of making diagrams of the relationships are useful in so far as they stimulate the imagination and help one to get a 'feeling' for the situation which will allow one to see how to go further into it. The diagrams are still very complicated. The only way to prevent this is to leave out some more of the information in the original table.

Another way of forming a mental image of the system, which is stimulating to the imagination of people who like to think of solid structures, is to regard the lines in the 'Venn diagram' as contour lines on a map and use them to build up a 'mountain' whose three-dimensional shape would then incorporate the information in the 'Venn diagram'. This can be done quite straightforwardly if we have used a lot of simplification to get a 'tree diagram' and a 'Venn diagram' on which the loops at any one level do not intercept (Figure 4.A.7).

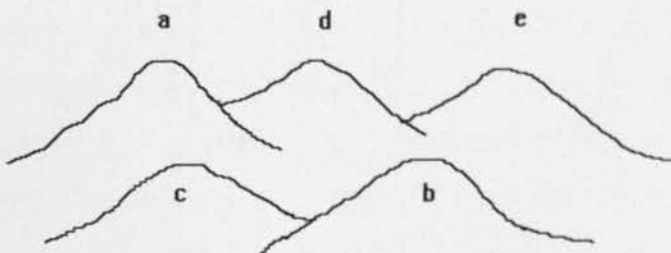


Figure 4.A.7 Mountain Diagram

This is a three-dimensional structure which gives overall picture of relationships.

Source: Waddington (1977)

There is yet another way of giving visual form to the relationships such as those set out in the table that this section started with. This is to write down the five elements: 'a', 'b', 'c', 'd' and 'e' on the page rather as it was done for the 'Venn diagram', then one can draw lines between those which are related to one another. If several grades of relationships are going to be used, then the proper way is to use thicker lines for strong relationships and thinner lines for weaker ones. This way of illustrating things is called 'association graph', a methodological tool which is popular among the professionals of built environment, such as architect and urban designers. It is possible to add more information by modifying this diagram with the length of the lines or giving character to the elements (Figure 4.A.8). It also can be three-dimensional. **In this thesis, the mixture of 'mapping the consequences', 'Venn diagram' and 'association graph' has been adopted to be able to make the model of production process paradigm in such a way to help identifying different stages of the process and its alteration in time and the effectiveness of feedback control, etc. [The Model (4.B)]**

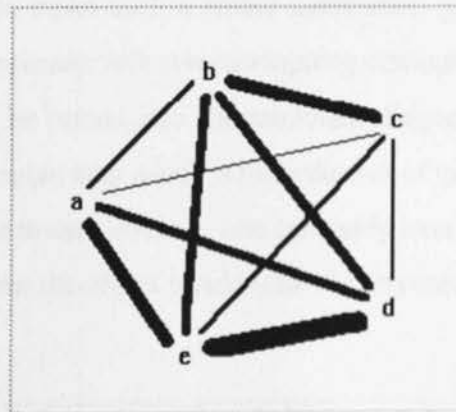


Figure 4.A.8 Association Graph (with several grades of relationships)

Source: the author

It would be very useful if such diagrams have been scaled. That is to say, there is a need for a kind of arrangement for the five points so that the distances between them are inversely proportional to the strengths of their relationships, so that the closely related ones are near together and the weakly related ones farther apart. This is what an architect would like to do when planning a group of buildings. Another group of workers who would be very interested to develop such methods are people studying the natural grouping (species, genera, etc.) of animals and plants based on the characteristics of the organisms, rather than on their supposed evolutionary history (Figure 4.A.9).

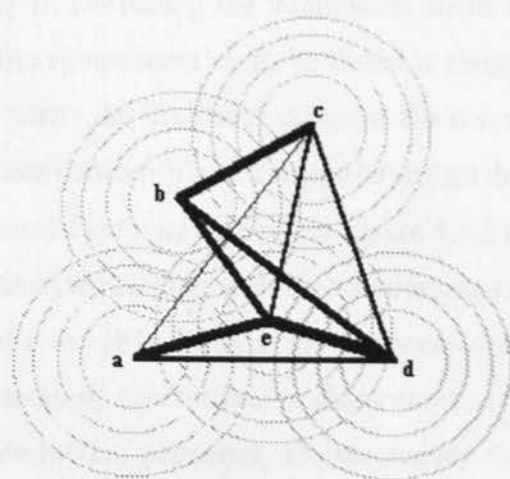


Figure 4.A.9 Scaled Association Diagram

The distances between the relationships of this diagram are proportional in terms of their strength.

Source: the author

There is another option to make such a scaled association graph as a basis for a 'Venn diagram', if one makes a simple one with non-overlapping contours. It comes out looking like Figure 4.A.10 which can be turned into the mountain diagram. This kind of diagram is sometimes called a topographic map which is the indicator of geographical and geometrical situations. By giving altitude to each contour, one can easily interpret the diagram in order to make an imagination of what the object would look like in reality.

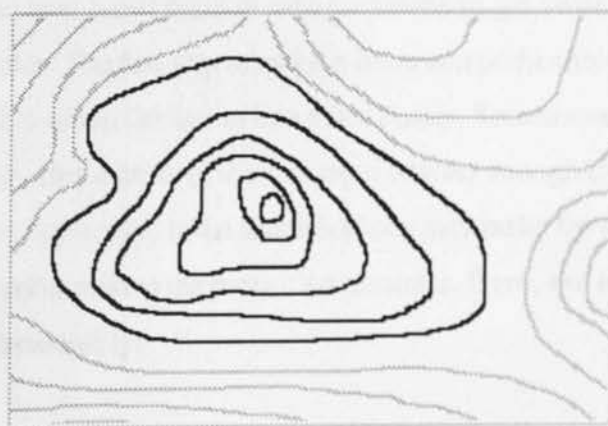


Figure 4.A.10 Non-overlapping Venn Diagram

The base of this kind of diagram is made by 'scaled association graph'.

Source: the author

The most complete way of expressing the information about the relations between the components is to list the five components 'a', 'b', 'c', 'd' and 'e' along a horizontal line and also vertically. At each square where the 'b' column intercepts the 'c' row, some figures indicating the strength of the interaction between 'b' and 'c' should be written down. This will give a table or 'matrix' made up of many figures as is shown in Figure 4.A.11. **The application of the matrix is abundant; one of which is to seek the relationships of different components of a system or different systems in timeless three-dimensional synchronous space. A concern has been given to apply this technic to illustrate the relationships between the end-products of the production processes, i.e. the supply-demand paradigm of the model of endogenous development (Section 4.B of this Chapter).**

	a	b	c	d	e
a	■	■	■	■	■
b	■	■	■	■	■
c	■	■	■	■	■
d	■	■	■	■	■
e	■	■	■	■	■

	a	b	c	d	e
a	5	2	1	4	3
b	2	5	4	3	2
c	1	4	5	3	1
d	4	3	3	5	4
e	3	2	1	4	5

Figure 4.A.11 The tables which classify relations in numbers or in a pattern of tones or spots
Source: Waddington (1977)

It is difficult for anyone who is not familiar with arithmetic to get sense out of this kind of models merely by inspection. The first step to make it more comprehensible is to forget about being really accurate and to group the figures into a few classes. Sometimes, it is good enough to simplify and simply say that a given pair either does interact enough to count or does not interact enough to count. Apparently, these simplifications may make the systems a bit easier to comprehend; it will involve making the picture less accurate. **Here, the information is lost in the sake of comprehensibility.**

The next step in making the picture easier to grasp is to rearrange things to bring out any natural groups in the system. There are several ways of doing this, each with its own advantages and disadvantages and some with more visual impact than others. One visually

appealing way is to represent the strengths of interactions by tones or sizes of dots instead of numbers (Figure 4.A.11). However, it is possible then to try to rearrange the rows and columns in such way as to produce a more comprehensible pattern. But, these are still in two-dimensional space and it is not always obvious how to rearrange the rows and columns to produce the most clear-cut patterns. Adding extra dimension, a three-dimensional matrix, which is more sophisticated than two dimensional ones, may be achieved (Figure 4.A.12).

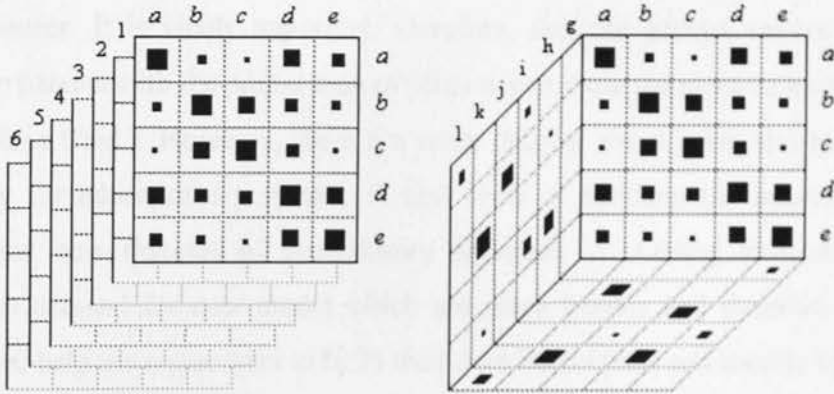


Figure 4.A.12 Overlay Approach [with independent layers (GIS)] and Cubic Approach (with independent cubes)
These are two kinds of three dimensional matrix.
Source: the author

As far as the author is concerned, this technic has been used for many years in different fields of the environmental studies. For more than twenty years an 'activity matrix analysis'³ has been applied as the basic studies in Urban Design in the Department of Architecture in Edinburgh College of Art, the place that this research was managed. The aim of the activity matrix, in words of Wood (1991-92, p. 3), is:

"to highlight the pattern of relationships that underlie the essential character of the system under study. It is this pattern that describes the stability of the system, i.e. the particular form of order that differentiates it from its environment. This ... is maintained by comprise the system. Where this balance is altered, so the character of the system will change. The use of the matrix is intended to assist in the manipulation of the

³ This analysis is based on Ecosystem Planning by Catherine Fortlage and Elizabeth Phillips (1972).

relationships with the aim of enhancing and strengthening the character of the system."

Environmental planning is essentially concerned with activities and resources. All activities occur in space within a time scale and require resources. The activity matrix is said to be a method for recording the characteristics of an activity in terms of space time and resources. The activity matrix is concerned with the spatial relationships that exist between activities. These causes have their perceived effects in space; the spatial effects can, in turn, become secondary causes. It is vitally important, therefore, that the activity matrix should be constructed in parallel with the preparation of plans which show the physical implications of the relationships (Ibid.). However, there are some debates about using this technique as methodology for educational purposes. A new tools of handling the information (e.g. computer) and new theories of evolutionary approach in building environment (e.g. structuralism) demand for new model which are more flexible and dynamic, a kind of instruction that help the researchers to build their own instructions and models upon it.

4.A.3.1. Different Types of Grid

Around the turn of the century, Patrick Geddes, a Scottish botanist better known as the 'father of town planning', developed the first matrix for urban analysis in 1927. The second was the C.I.A.M.⁴ grid, invented a generation later in 1934 by Le Corbusier, a French architect and urbanist who practised throughout the world. Then, in the mid 1950s, C.A. Doxiadis conceived both 'Ekistics': the science of human settlements and its representation on a grid (Bell et al. 1972). Symbolically, each of these matrices encompasses the totality for analysis of urban problems and also sets the framework for new developments. Such grids display any component within two dimensions at a point of intersection of abscissa and ordinate.

There are common properties in the three grids. The first two derived from the work of the Frenchman Frederick Le Play (1806-82) who, although trained as a mining engineer, did

⁴ C.I.A.M. (Congres Internationaleaux d'Architecture Moderne) held by participation of eighteen countries in 1939. This Congress produced the Charte d'Athenes, a series of statements and recommendations in which the Corbusier's four functions were used as the main heads. Among the audience at the final session of this Congress in Athens was a young Greek architect, C.A. Doxiadis. He was greatly impressed by the ideas put forward on this occasion and twenty years later he developed the five ekistic elements: 'Nature', 'Man', 'Society', 'Shell' and 'Network'.

pioneer work in the methodology of social research, particularly in the study of family budgets. Le Play emphasized the relationship between the family, its physical environment and its work patterns. 'Lieu', 'Travail' and 'Famille' were cited as the three dominating forces of society. This trilogy was directly taken over by Geddes as 'Place', 'Work' and 'Folk'. The connection is less direct in Le Corbusier's four Functions of land use: 'Habiter', 'Travailler', 'Cultiver le corps et l'esprit' and 'Circuler' (Ibid.). Thus, the ordinates (vertical axis) of the three grids are very similar:

Geddes

Place
Work
Folk
—

Le Corbusier

Recreation
Working
Living
Transportation

Doxiadis

Nature and Shell
Society
Man
Networks

It is the abscissa (horizontal axis) that differ. For example, Patrick Geddes's grids (Geddes used them as a personal thinking machines and called them 'diagrams') had identical ordinates and abscissas. The C.I.A.M. grid (Le Corbusier used it to classify the work of his architectural and planning practice) was seen as a tool for Le Corbusier and were used to display relevant aspects of his work on particular projects and had a sequence of headings in its abscissa intended to act as a check list for the practising architect-planner. The numbers listed beside each heading represented a simple code by which information could be recorded and retrieved. Finally, a major contribution of the Doxiadis's ekistic grid was that it incorporated a complete spectrum of the range of human settlements in fifteen 'ekistic units' that occupy the abscissa of the ekistic grid which had a simple and obvious relationship and had been assigned arbitrary population figures- from the single Man to the world-encompassing ecumenopolis⁵.

Because of the special characteristic of Geddes's diagrams and their similarities the technique used for illustrating the supply-demand relationship, a paradigm of endogenous development model (Section 4.B), the author would like to emphasize on the properties of Geddes's basic and most complex thinking machine which is quite different from the other two grids. To start

⁵ These fifteen ekistic units are: Man, Room, Dwelling, Dwelling Group, Small Neighbourhood, Neighbourhood, Small Town, Town, Large City, Metropolis, Conurbation, Megalopolis, Urban Region, Urbanized Continent and Ecumenopolis.

off, here is his statement of the logic involved quoted from A Proposed Coordination of the Social Sciences ('Sociological Review', January 1929): "In general terms, any two factors in social life have two sub-relations." Similarly and in general terms, any three factors in social life have six sub-relations. The next step is to substitute triads of social factors for A B C which leads to the $3 \times 3 = 9$ squares and then to 9×4 sets of such triads = 'The 36-Chart' (Boardman, 1978). Graphically this may be expressed as in Figure 4.A.13.

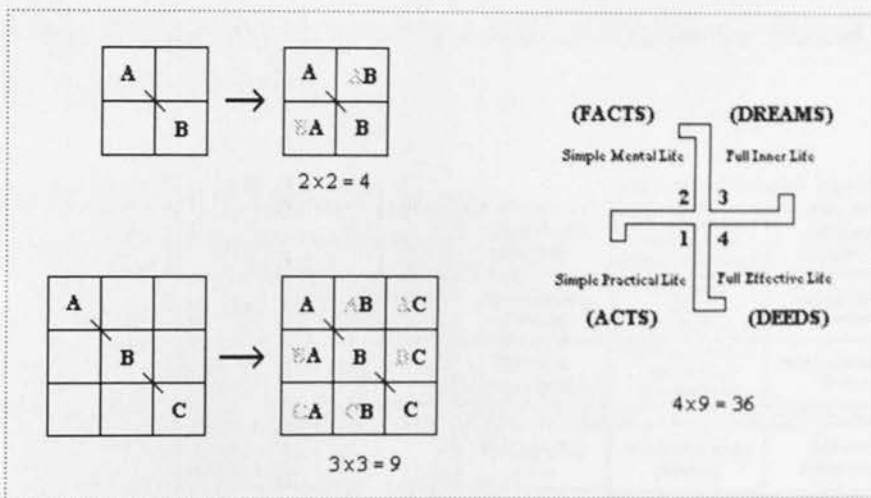


Figure 4.A.13 The Notation or Chart of Life

This is Geddes's basic and most complex thinking machine.

Source: Boardman (1978)

In the matrix which has been employed in this thesis for showing the relationships between the different sectors of a region (i.e. supply-demand paradigm in Section 4.B), it is argued that each sub-relation can be divided into four types of relationships through which positive and negative supplies/demands correspond to each other. Therefore, for any two factors in social life there exist eight kinds of sub-relation. In fact, rows and columns illustrate two different behaviours of the matrix [e.g. in sub-relation AB when B is the real cause, B's role is dominant (producer) and A is its dependence (consumer); and in sub-relation BA when A is the real cause, A's role is dominant (producer) and B is its dependence (consumer)]. Moreover, the diagonal axis of the matrix is also very important. Thus, it has been exercised in several models by the author from 1983 onwards. In these models, the diagonal axes are the essential part of the models responsible for generating the surface structures as well as the deep structures. Following this experience, a cubic approach was adopted to show the genetic

structure of productive forces in a regional plan as well. This aimed to trace and to filter some information resulted from different scales: local, regional and national levels. [See some of these models in Section (I) of Appendix One, i.e. Some Typical Models.]

To Geddes, his diagrams were 'thinking machines' - means for checking that everything relevant had been taken into consideration. But, Geddes was very interested in the improvement of the environment of towns; and from thinking he moved to action (Bell et al. 1972). Geddes devised a way of organizing a fourfold diagram that pointed the way to constructive action (Figure 4.A.14).

Directive Facts: The School			Reflective Dreams: The Studio		
Sense	Sensed Experience	Sensed Feeling	Imaged Emotion (Symbol)	Imaged Ideation (Mathematics) (Graphic Notations)	Imagery (Imagination)
Experienced Sense	Experience	Experienced Feeling (Folkways)	Ideated Emotion (Doctrine)	Ideation (Science) (Pro-Synthesis)	Ideated Imagery (Design)
Feeling Sense (Home)	Feeling Experience (Mastery)	Feeling	Emotion (Mysticism) (Religion)	Emotioned Ideation (Philosophy) (Pro-Synthesis)	Emotioned Imagery (Poetry)
Folk Place	Folk Work (Occupation)	Folk	Ethnopolity (Love)	Politized Synergy (Wisdom)	Politized Achievement
Work Place	Work	Work Folk	Synergized Polity and Life	Synergy	Synergized Achievement
Place	Place Work (Natural Conditions)	Place Folk	Achieved Polity and Life	Achieved Synergy	Achievement
Operative Acts: The Town			Executive Deeds: Utopia		

Figure 4.A.14 Thinking Machines (Geddes's fourfold diagram)

A modification has been applied in the above illustration which is adapted to Bell et al. (1972) and Boardman (1978), i.e. changing the quadrants of the top with the quadrants in the bottom of the matrix to be able to compare it with the model used for research methodology (Figure 5 in Introduction).

Source: the author

Each quadrant of the diagram expresses an explicit component of the planning process. The first quadrant represents the present urban structure and he called it 'acts'. The quarter above it (below it in the main quotation) is the survey phase of planning when the collection of data and its analysis are translated into 'facts'. The third moves to the area of reflective 'dreams', where policies and plans are evolved. Finally, the fourth emerges into executive 'deeds': operative programmes for development. These would reappear as 'acts' in the first quadrant at the start of the following planning cycle. The key terminology changes for each phase, but remains parallel:

1	2	3	4
Acts	Facts	Dreams	Deeds
Place	Sense	Imagery	Achievement
Work	Experience	Ideation	Synergy
Folk	Feeling	Emotion	Ethnopolity

Thus, this 'thinking machine' became a tool to express the evolution of cities. Inherent within it was the notion of feedback: that every planned action would effect the following stage in the development of a city (Bell et al., 1972). But, what the author found noticeable about Geddes's thinking machine is its symmetry and completeness. It implies that he believed that societies worked according to a set of rules much like the clockwork of the Machine Age. Everything would fit together and be perfectly balanced. There did not seem to be any allowance for diachronous changes which are the origin of the synchronous typologies or end-products in surface structure of the systems.

In practice, what is intended to be done for a complex system or a situation often involves not merely the difficult enough task of harmonizing different types of requirement in a model; the confrontation is what at first sight seems an even more terrifying challenge, namely to plan how to adapt the system to the future even when the realization is that it cannot be possible to predict the future. Many planners seem to think that this is obviously impossible. In fact, one of the conventional responses to any talk of modelling the future plan is to say that the only thing certain about the future is that it will not turn out as it was expected to be. But, finding some way of coping with an unpredictable future has been the main challenge which model makers and planners have been faced by. Moreover, the result of the new interest in the future has been the development of a number of systematic, semi-scientific and intuitive techniques and models for forecasting⁶.

⁶ There are many techniques of forecasting two of which is distinguished by Waddington (1977) as 'exploratory' and 'normative'. He divided the former into three classes: techniques for improving intuitive forecasts (Brainstorming, Delphi and Cross-Impact); techniques for structuring and precessing existing technological information (Scenario Writing, Operational Modelling and Gaming-Simulation); and Techniques for generating new technological information (Trend-Curve Extrapolation and Morphological Analysis). The best-known techniques of the second are based on Relevance Trees and Goal Hierarchies.

Conclusion of Modelling

There have been developments of the procedure for developing a 'model' of the systems of situations. These developments have been occurring because computers have become powerful enough to handle models which are so complex that it would be boring to deal with them by ordinary algebra or arithmetic. If the model involves several things which interact with one another (e.g. the population, food supply, industrial equipment available, pollution produced and a few others) and particularly if the strength of the interactions does not stay constant (e.g. pollution may have little effect on the other things until it increases above some limit which it may begin to get more and more important), **then the model may involve equations which cannot actually be solved by algebra in the present state of the art.**

This sort of operation produces a lot of figures which can be made into elegant graphs. The possibility of getting such results out of ideas about what the system is like, which previously it had been impractical to handle, is obviously very seductive. But, letting oneself be seduced is only sometimes, unfortunately by no means always, a good thing in the long run. The results of these techniques on models of complex systems look adequate and precise, but can actually be no better than the ideas which go into them. These techniques, for example using computers, will turn out a result from a lousy model just as happily as from a good one; in fact, it cannot tell the difference.

However, this section was conducted to investigate different proposals in the discourse about the complexity of situations, models, modelling processes and making models. Talking about different kinds of model, a special emphasis was given to the 'purposive' models and to the 'causal network' models. The appropriate way of illustrating the production process, which is the characteristic of the model of endogenous development, is considered by the author to be a 'mapping the consequences' (similar to the approach used in Figure 4.A.2). And the 'matrix' or grid technique is assumed to be the best way of illustrating a causal network models such as the paradigm used for supply-demand relationships (see next section, i.e. 4.B).

A limitation of the capacity of human brain in dealing with the complex world was also a

matter of significance in the discourse about modelling. Therefore, there is a need for the symbolic concepts to help people to reduced either to taking decision in the light of only seven or eight particular facts or to turning the whole things over to computers. These simultaneous items, that can be brought into immediate consciousness, need not be items of specific detailed information. Some of them may be complex ideas or theories synthesizing into a single concept, a mass of minute details. The process of formulating these theoretical concepts, creating symbols or making models which are either the results of our daily life or from a highly professional activity, can be named modelling which involves model making process. It means that human kinds can and are modelling their complex situations by symbolizing their components. These models (which are observed in different situation and with different purposes such as dogmas, schemata, values, symbols, genes, metaphors, etc.) are helping them to perceive, conceive and memorise information in order to make programmes and instructions out of them. Modelling, like the process of pursuing scientific paradigms, needs both induction and deduction.

Because any description of the absolute must be limited, people can reveal it by using symbols and models which cut directly through all the layers and windings of their consciousness. Each symbol/model has unity. Since it cuts through all levels and therefore dimensions. The function of symbolism and modelling is to go beyond the 'limitation of fragment' and link the different 'parts' of the whole or alternatively the worlds in which these parts manifest. Each symbol/model is a link on the same frequency with the world above, a different plane of reality (facts). In this regard, all the manifestations or all the people experiences are symbolic and that the whole of existence is a continuum which is ordered in itself. It has no manifest appearance and thus cannot be observed immediately by sense perceptions, but its inherent dynamism manifests in images whose structure participates in that of the continuum. This structure consists of different models or symbols each of which bridges (design) the gap between facts and acts, as two sides of a coin (Figure 4.A.15).

Although it is not possible to give anything like a complete or accurate picture of the complexity of the world, models enable model makers to search for new interpretations of different definitions. For example, it will be much easier for researchers to use the

relationships of the mathematical and geometrical figures and shapes to justify the learning process of human being and differentiate it from that of the other living creatures. There exists a magical point in a mobius strip⁷ which twists the strip and allows one to have an unlimited journey upon its both sides without any deviation from the original path. If facts and acts are considered in two different sides of the ribbon, the model shows that bridging between them is obtainable and is a matter of creativity. So, creativity means to induce perceived information into models and deduce these concepts to give instructions, designs and plans applicable in real situations to solve the problems. The relationship between different models of different situations makes an interconnected chain of models (hypothesis) which is open-ended and have feedback control, so is a kind of living process. The point in this example is that facts and acts are not separable and either hard to be distinguishable but are necessary and sufficient for making models, therefore building the dreams in order to make the right instructions and deeds of action.

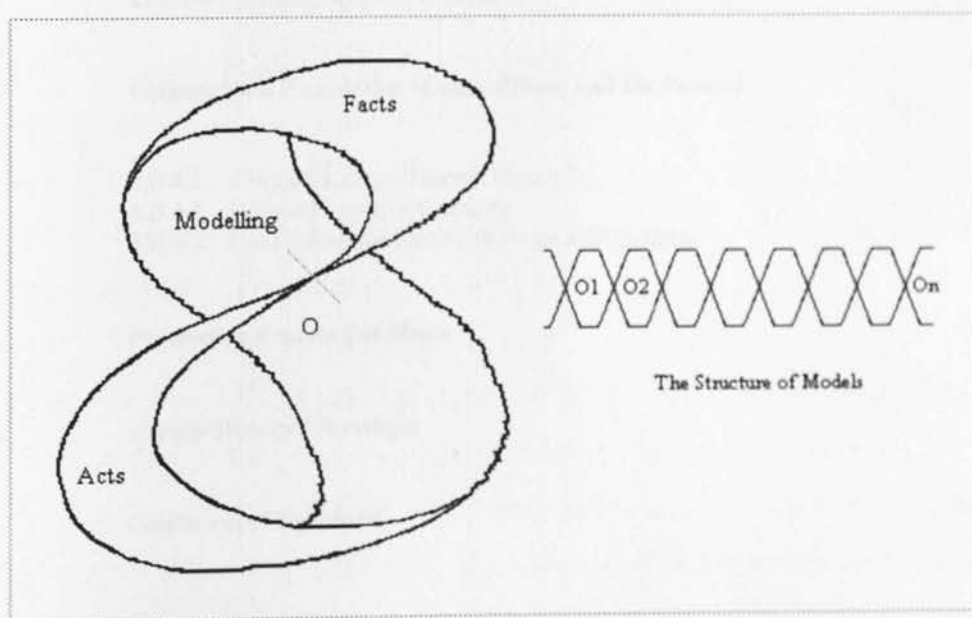


Figure 4.A.15 Modelling and hypnotising the complex situation by using a mobius strip
This helps illustrating the construction of individual's/society's structure of thought.
Source: the author

⁷ See the Mobius Strip II, by M.C. Escher (Woodcut, 1963) in Hofstadter (1980).

4.B

THE MODEL

Introduction to The Model

4.B.1. **Culture as a Complex Whole**

4.B.2. **Knowledge, Collective Enlightenment and Totality**

- 4.B.2.1. Pragmatic and Semiotic (Signs and Symbols)
- 4.B.2.2. Subject-Object Dualism
- 4.B.2.3. Cyclic Time and the Process

4.B.3. **Logical Thinking and The Process**

4.B.4. **Philosophical Foundation (Cause-Effect) and the Process**

- 4.B.4.1. Things View and Process View
- 4.B.4.2. Different Types of Causality
- 4.B.4.3. Final Cause and Finality in Purposeful Systems

4.B.5. **Production Process Paradigm**

4.B.6. **Supply-Demand Paradigm**

Conclusion of The Model

Introduction to The Model

On no account is it permissible to mention living beings and the other kinds of system, for example machines, in the same breath. Living beings are living beings in all their parts; while machines are made of metals and other unorganized substances with no fine structure relevant to their purposive function. Physics takes no account of purpose; and the emergence of life is something totally different and should be looked at implicitly and explicitly.

Furthermore, in contrast to the animal which has an 'ambient' determined by its organization Man himself creates his world which is called 'human culture'. Among the presuppositions for its evolution are two factors: language and formation of concepts (models) which are closely related to each other. 'Language' as appeal or command can already be observed in the animal worlds; examples for this are the singing of birds, the warning whistle of mountain chamois, etc. Language, in the wider sense of the word, contains not only oral speech but also script and the symbolic system of mathematics. These are systems not of inherited but of freely created and traditions symbols. First of all, this explains the specificity of human history in contrast to biological evolution: tradition in contrast to hereditary mutations which is said to occur only over a long period of time. Secondly, physical trial-and-error, largely characteristic of animal behaviour, is replaced by mental experimentation, i.e. one with conceptual symbols. For this reason, true goal-directedness becomes possible (see also the discussion about goal-seeking and purposeful systems in Section 3.B).

Goal-directedness and teleology in a metaphorical sense, i.e. regulation of happenings in the sense of maintenance and production and reproduction of organic wholeness, is a general criterion of life. True purposiveness implies that actions are carried out with knowledge of their goals and of their future final results; **the conception of the future goal does already exist and influences present actions**. This applies to primitive actions of every day life as well as to the highest achievements of the human intellect in science and technology. Furthermore, the symbolic world created by Man gains a life of its own, as it was; it becomes more intelligent than its creator - therefore it is in the top level of the hierarchy of the complexity of the systems (see for example Boulding's (1956) hierarchy in Section 3.B).

The symbol system of mathematics, for example, is embodied in an enormous thinking mechanism which, fed with a statement, produces in return a solution on the basis of a fixed process of concatenation of symbols/models which could hardly be anticipated. On the other hand, this symbolic world becomes a power which can lead to grave disturbances. If it comes to a conflict between the symbolic world which in human society has emerged in moral values and social conceptions and biological derives which are out of place in cultural surroundings, the individual is confronted with a psychoneurotic situation. As a social power the symbolic world which makes Man human at the same time produces the optimistic course of history. In contrast to the naïve struggle for existence of organisms, human history is largely dominated by the struggle of ideologies, i.e. of symbolisms which can be the more dangerous instincts. It is not possible to revoke the course of events which has produced what is called 'Man'; it is up to him, however, whether he applies his power of foresight for his enhancement or for his own annihilation. In this sense, the question of what course the scientific world conception will take is at the same time a major problem.

Some of these problems, which have been reviewed briefly in Chapter One (1.A), shows that all the general bias seen, for instance in Ackoff's (1984) writing, relies on clinical analogies (Islami, 1995). His assessment of the notion of problem in a 'symptomatic' view is clinical. The author's attempt was to focus the debate into more rigorous areas such as the concept of the Kuhnian paradigm (1970). A paradigm, Kuhn says, consists of a set of implicit rules for identifying a valid scientific problem and for recognizing what is a solution to it. Rosenhead (1990) identified three conflicting paradigms (official, reformist and revolutionary) contending for ascendancy. Considering this classification, the author would like to suggest that the production process is a revolutionary paradigm in an endogenous development context which helps identifying the main problems and their solutions.

To achieve better understanding of endogenous development model, the thesis aimed to pursue the background of the research by reviewing the discourses, criticising different attitudes and suggesting evidence of their applications in different situations (similar to the case study's situation). Therefore, the main objective has been to be familiar with the scientific issues guiding the attentions towards a proper model for

development. There is another consideration to assume that this model will help finding the essential problems, especially those which are emerging in dramatic changes after revolutionary, reformist and official programmes and plans. The cause of these problems might be either external or internal and the ways for solving them should be sought throughout the main context which, of course, requires enlightened human judgement. Although, all interaction between objects, events and their properties could be reduced by analysis of one fundamental relationship cause-effect, there is still a need for teleological concepts - function, goals, purposes, choice and free will - in explaining the development of natural phenomena especially that of human activities.

4.B.1. Culture as a Complex Whole

The term 'culture' is said by Wagner (1975, p. 21) to be derived from "... the past participle of the Latin verb colere, to 'cultivate', and draws some of its meaning from this association with the 'tilling of the soil ...' in later times, 'culture' took on a more specific sense, indicating a process of progressive refinement and breeding in the domestication of some particular crop or even the result or increment of such a process. Thus, we speak of agriculture: 'culture of wine', or of a bacterial culture." In this sense, the term 'culture' is mostly employed either to élitist connotation of creativity and evolution, or it is used in its historical context to refer to knowledge, productivity and way of living of a certain civilisation.

'Taqaafa', the Arabic synonym of 'culture', gives a more precise meaning of refinement and education. Thus, when speaking of 'human culture', it is about what makes Man different from other species: the refinement of his mind and his activities (Barakat, 1993, p. 49). In words of Collins Dictionary culture is: "... the total of the inherited ideas, beliefs, values and knowledge which constitute the shared basis of social action." In this relation, Aysan et al. (1987, p. 10) assert: "Culture is the expression of Man kind in society." Culture or Civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, symbol, custom, and any other capabilities and habits acquired by Man as member of society¹.

¹ Reprinted from *Primitive Culture* by Edward B. Taylor, Vol. I, pp. 1-6, John Murray, London, 1891.

Apparently, much of human behaviour is governed by culture - the system of shared attitudes and symbols that characterizes a group of people. The culture of people is a shared schema that designates regularities in a group's thinking and behaviour. Individuals are socialized within a culture, but their behaviour also shapes the culture so that it is not something static, but something that evolves over time. Each culture is unique because it has its own history. This does not mean that certain values are not held by many cultures, but that each culture is a result of the past efforts of people to deal with its physical and social environment.

People can deal with their own cultures in an unconscious manner. As a result of being socialized into a culture, an individual has the ability to know the appropriate behaviours. This holds for professional as well as societal cultures. In this regard, Montgomery (1966) suggests that architects (experts) are members of at least two cultures embedded in each other. Each has its own socialization processes. One culture is, he says, the professional culture and the other is that of the broader society within which the professional culture exists. The professional society has its own norms of what is acceptable including attitudes that define appropriate symbols for the built environment. These norms can be extremely coercive. Designers have long attempted to influence cultures through the products they design by creating symbols for society. Their ability to do so depends on the strengths of attitudes toward existing system and the designers' ability to convince others of the symbolic meaning of new built form (Lang, 1988). There are, however, conflicting interpretation of how these processes occur (Hine, 1978).

4.B.2. Knowledge, Collective Enlightenment and Totality

What all appear to be exploring in common is the relationship between doing and knowing in person-environment transactions. The model of endogenous development suggests that doing and knowing are somehow in correct correspondence: i.e. what we know about an environment, including how we feel about it, is confirmed both in the immediate and long term consequences of the actions based on this knowledge. Conversely, the model suggests an openness of knowing to the consequences of action and a modification of what is known or believed in light of these consequences [see also the discussion about indigenous knowledge in Chapter Two: Designing with Indigenous Knowledge (2.B.2.2.)].

There are within every one of us three stages of knowledge (Purce, 1974). The first is suggested by her to be 'the spiral process' by which not only individual but the cosmos itself becomes realized; for it represents the course of revolution. Thus, she says, in the early days of humanity, as in childhood, there was no separation between people and outside world until they individually or as a race became self-conscious. Then, their individual and collective ego crystallized and they could see themselves as subject and as distinct from the world which became the object of their inquiry. Secondly, the continuum differentiated into 'things' or products of human activities. Each branched into more things and products by which in turn branched into even more until the continuum had developed into a hierarchy; for example language, which once flowed into verbs and processes, broke up into nouns and connectives. The third stage for the individual is that of intuitive knowledge or enlightenment in which subject and object again become one. In collective terms, this return (or feedback in the production process paradigm) to a continuum implies not only the need for a new language, but that the analytic and quantitative world is winding itself into a new simplicity.

There is also a correspondence between each individual consciousness and unconsciousness which is mentioned by Lang (1988, p. 25): "... the growth of personality is regarded as a movement in which the individual is able to integrate greater and greater amounts of the unconscious into her/his conscious life. Thus, an individual (or a group of people) increases her/his ability to deal with the unconscious until a 'rebirth' occurs. Rebirth involves a restructuring of what is conscious. The process is accompanied by an empathy for increasingly complex forms until the rebirth occurs, when the empathy returns to simple forms."

In British empirical school of philosophy, from Locke to Hume, the content of the mind was considered to be made up of certain entities known to Locke as 'ideas' and to Hume as 'ideas and impressions'. The simple ideas or impressions were supposed to exist in a purely passive mind as free from influence on the ideas it contained as a clean blackboard is on the symbols which may be written on it. By some sort of inner activity these ideas were supposed to unite themselves into bundles according to the principles of **similarity**, **contiguity** and **cause and effect**. Saying this, Wiener (1948, p. 149) adds that of these principles "the most significant was contiguity: ideas or impressions which had often occurred together in time or in space

were supposed to have acquired the ability of evoking one another, so that the presence of any one of them would produce the entire bundle."

Knowledge is also said to be complex intertwined with communication, power with control and the evaluation of human purposes with ethics and the whole normative side of religion. Religion is a serious matter that people must separate sharply from any consideration of personal values of less significance than religion itself. The learning of individual is a process that occurs in the life of the individual in 'ontology'. Biological reproduction of a phenomenon that occurs in the life of the race in 'phylogeny', but the race learns even as the individual does. Darwinian natural selection is a kind of racial learning which operates within the conditions imposed by the reproduction of the individual (Wiener, 1964). The learning to which Wiener has been referred to is that of the individual which occurs within the time course of her/his individual private life. There are also some arguments about another type of learning in biology - phylogenetic learning or learning in the history of the race. It is this type of learning for which one type of basis has been laid down by Darwinians in the theory of natural selection².

Consequently, it is worthwhile mentioning that although science is legitimate in itself, the role and function of science and its application have become illegitimate and even dangerous because of the lack of a higher form of knowledge into which science could be integrated and the destruction of the sacred and spiritual value of nature. Nasr (1968) indicates that peace in human society and the preservation of human values are impossible without peace with the natural and spiritual orders and respect for the immutable supra-human realities which are the source of all that is called 'human values'.

² The basis of natural selection lies in three facts. The first of these is that there is such a phenomenon as 'heredity': that an individual plant or animal produces offspring after its own image. The second is that these offspring are not completely after its own image but may differ from it in ways also subject to heredity. This is the fact of 'variation' and hardly implies the very doubtful inheritance of acquired characteristics. The third element of Darwinian evolution is that the over-rich pattern of spontaneous variation is yielded by the difference in the viability of different variations most of which tend to diminish the probability of continued racial existence, although some, perhaps a very few tend to increase it (Wiener, 1964).

4.B.2.1. Pragmatic and Semiotic (Signs and Symbols)

C. S. Peirce and Charles Morris had a common purpose in supplying science as a foundation for a theory of knowledge and both felt it could be done through the behavioural background specifically associated with language signs. George (1979, p. 84) asserts: "... the main difference between their work and Ogden Richards [1923] and Korzybski's [1933] work is that the latter is rather more general in being concerned with other sorts of signs besides language signs and it is for this reason that they have called their work 'pragmatic' and the former have called their work 'semantics'. However, the former's work on semantics was concerned with actual utilisation of the signs, it is probably better described as pragmatics."

'**Semiotic**' is the name that was originally chosen by Peirce as well as later by John Locke to categorise this particular scientific study of signs. Sometimes, it was referred to as 'semiosis' and sometimes it has become known as 'behavioural semiotic'. **Pragmatics** should be used to cover all these different versions of what is really a theory of sign behaviour. There are still various possible approaches, some more philosophical and some more scientific, in so far as one can make such a distinction (Ibid.).

Peirce in defining the subject 'semiosis' thought of it as the study of signs, sign process, sign-mediation and other context relationships existing between people, particularly with respect to their trade in signs and symbols both with each other and with the environment. A mental process, for Peirce, was a 'sign process'. The 'representamen' as he called it, is something that is a mental event and it is also the representation of a thing or object for which it stands. It is exactly what some called a 'thought' or reference and what the author has tended to call a concept or conceptual process. Signs are representamens of human minds used by them and manipulated by them in representing through language the world around themselves. This is indeed a sort of model building process. So, black clouds are a sign of rain and 'rain' is a symbol for rain and certainly it is true that in describing rain it is only a sign by theory of meaning, as some have argued circularly since George (1979) claims that symbols are signs and signify (although by convention).

Lang (1988) has introduced brief definitions for 'image', 'symbol' and 'sign' with the

assumption that these terms are often used interchangeably. An 'image' is an imitation or a reproduction or a similitude of something. A 'symbol' is something that stands for something else. It may do this as the result of an association, a convention, or even an accident (Burchard et al., 1966). A 'symbol' is the result of a cognitive process whereby an object acquires a connotation beyond its instrumental use. An 'object' may be an environment or a person as well as a material artifact (a product). Its meanings are derived from what an observer imputes to them (Kepes, 1966). A 'sign', in contrast, is a conventional figure or device that stands for something else in a literal rather than an abstract sense.

The symbol is also known as the basic unit of all human behaviour and civilization. Human behaviour is symbolic behaviour; symbolic behaviour is human behaviour. The symbol is the universe of humanity. A symbol may be defined as a thing³ the value or meaning of which is acknowledged by those who use it. The meaning or value of a symbol is derived from or determined by properties inherent in its physical form. The meaning of symbols are derived from and determined by the organisms who use them; meaning is acknowledged by human organisms upon physical things or events which thereupon become symbols. All symbols must have a physical form or a concrete system otherwise they could not enter our experience. The meaning of a symbol can be grasped only by non-sensory and symbolic means.

But, a thing which is in one context a symbol is not a symbol in another context but it is a sign. Thus, a word is a symbol only when one is concerned with the distinction between its meaning and its physical form. This distinction must be made when one acknowledges value upon a sound-combination or when a previously acknowledged value is discovered for the first time; it may be made at other times for certain purposes. But, after value has been acknowledged upon or discovered in a word its meaning becomes identified in use with its physical form. The word then functions as a sign, rather than as a symbol. Its meaning is then grasped with the senses (Lang, 1988).

People usually define a sign as a physical thing or event whose function is to indicate some

³ 'Thing' is used here because a symbol may have any kind of physical form; it may have the form of a material object, a colour, a sound, an odour, a motion of an object and a taste.

other thing or event. The meaning of a sign may be inherent in its physical form and its context as in the case of the height of a column of mercury in a thermometer as an indication of temperature or the return of robins in the spring. Or, the meaning of a sign may be merely identified with its physical form as in the case of a hurricane signal or a quarantine flag. But in either case, the meaning of the sign may be ascertained by sensory means. The fact that thing may be both a symbol (in one context) and a sign (in another context) has led to confusion and misunderstanding (Ibid). To be sure, the symbolic faculty was brought into existence by the natural processes of organic evolution which consists of feedback control.

The built environment maintains symbolic meaning in subtle ways. The correspondence between a building pattern or set of patterns and what is signified has to be learned. Sometimes, this is done consciously, but often is unconsciously. Architects, among others, often attempt to establish new symbol systems. To get them accepted, they have to educate others about the set of associations between the new patterns (the symbol) and the signified. This may involve advertising, polemic writing, or direct teaching. Some of this process may be controlled by professionals, but other meanings are largely unconsciously developed (Lang, 1988). Therefore, the designers cannot rely on their intuitive knowledge because those are drawn from their own experiences and not that of others. For instance, some places are peculiarly associated with certain people or events. A particular setting may have symbolic meaning not because of its physical attributes, but because of the events that took place there. The building becomes a symbol of the events. In this case, the form of the building is largely irrelevant in terms of their associational meaning (Rapoport, 1977). This type of symbolism is thus beyond the control of the designer.

The symbols that people choose to have around them may reflect their perceptions of who they are or may reflect their perceptions of who they aspire to be or may simply reflect a rejection of the past. If one aspires to be a member of a group, then the symbols associated with that group become particularly important. It should be noted that the perception of important symbols associated with a group might well differ between those outside the group and those who are members. If one has full membership in a group the symbols of membership became less important and the environments chosen are more likely to reflect personality or

other characteristics. This is also true for those whose needs are primarily self actualization and cognitive and aesthetic ones (Ibid.)

Man's mind needs also to regularize the universe. All cultures have a kind of regularizer system to do it. So, they can contact with own environment by a special symbolic regularizer system. These systems change during the age in different cultures, but they do not improve or expand with the passage of time. So, it is conceivable to see that the Australian Tribe's regularizer systems are as complex as modern people and even sometimes more complex (Purce, 1974). But, traditional frameworks are unlikely to be expressive nowadays. Technology and industrialization have changed all the things. Therefore, it is necessary to know new purports based on new needs. Do we have to follow the past or making new vocabulary based on basic rules which have been examined in the past? Is it possible to reject the principles or could we have any doubt about them? Alexander (1979 , p. ix-xiii) answers:

"It is a process which brings order out of nothing but ourselves, it cannot be attained, but it will happen of its own accord, if we will only let it. ... There is a central quality which is the root criterion of life and spirit in a man, a town, a building, or a wilderness. It is objective and precise, but it cannot be named. ... The search which we make for this quality, in our own lives, is the central search of any person. ... It is the search for those moments and situations when we are most alive. ... **This quality in buildings and in towns cannot be made, but only generated indirectly by the ordinary actions of the people, just as a flower cannot be made, but only generated from the seed. ... It is not a process of addition in which preformed parts are combined to create a whole, but a process of unfolding like the evolution of an embryo in which the whole precedes the parts and actually gives birth to them by splitting.**" [This is similar to the emphasis of this thesis which is concerned about people's participation in production process. But, their involvement is very specific and significant in synthesizing the objects (which is explained as inductions and abduction reasoning discussed in Section 4.B.3.) in order to qualify them; to build up the structure of their thought and core values; and even to particularise their plans and designs.]

The same source indicates that the language, like a seed, is the genetic system which gives the million of small acts of people the power to form a whole. The language and the processes which stem from it merely release the fundamental order which is native to us. They do not teach us, they only remind us of what we know already and of what we shall discover when we give up our ideas and opinions, and do exactly what emerges from ourselves.

4.B.2.2. Subject-Object Dualism

In seeking for objective knowledge (science), it has been Man's tendency to forget that, ultimately, subject and object are not separated rather they are one and merely opposite ends of the same axis (Purce, 1974). The consequence of this has been a swing back to the observational scientists of 'complementarity': light is both particle and wave, depending on the mode of one's participation in its being. In other words, the method of observation (that is the nature of the observer) changes the apparently fundamental nature of light and is not, therefore, totally distinct or apart from it.

Physicists are searching for a new language, not only to express the continuum of the universe, but also to express the cyclic nature of space and time. The understanding, for example, of the Sufi mystic Ibn' Arabi, who says that 'every cause is the effect of its own effect', is of an order necessary for the physicists discussing the nature of matter who say that among strongly interacting sub-nuclear particles, each particle helps to generate every other particle which in turn generates it.

The purposes of human activities of generating objects and developing subjects in coping with the environment is a matter of significance. Purce (1974, p. 32) points to the balance of the their relationship and writes; "The sudden interest in the spiritual world, in the nature of the One ... is the violent redress of an imbalance. As all expansion leads to contraction and out of every extreme is born the seed of its opposite, so our almost exclusively analytic and quantitative approach to the world leads into a new vision of the continuum; and we turn on to the next winding of the evolutionary spiral."

In a three-dimensional spiral the origin and end are in the opposite pole of a central axis. Purce

claims that this is the axis of consciousness and its 'end' is not the second but the duplication. Duplication of the One is simply the One looking at itself and in so doing becoming subject and object: this is the duality by which all is known. Then, she points to the third element keeping this dual picture in mind and names it 'relation'. By saying that, the distance between subject and object is knowledge. In this regard, she brings some examples one of which represents the point of view of Islamic tradition: 'I was a hidden treasure and I loved to be known, so I created the world.' On the spherical vortex suggested by her, the hidden treasure is the point of origin. The thesis suggests that in the process of becoming subject into object and the vice versa, in human creativity and in forming the relationship between subjects and objects as knowledge, there is an element of time involved which needs further exploration.

4.B.2.3. Cyclic Time and the Process

Ah, my Beloved, fill the Cup that clears
Today of past regrets and future fears.
Tomorrow? Why, tomorrow I may be
Myself with Yesterday's seven thousand Years.

Omar Khayyam (Persian poet, Nishapur, 1048-1131)

In his presentation in 'A Symposium on the Relation between Continuity and Change', Raymond Monelle (1997) concentrated on 'Lyric Time and Progressive Time in Music' and classified 'time' into a wide range of definitions such as historical time, cultural time, ecological time, structural time, abstract time, progressive time, etc. But, what time does really mean in the intentional process of producing things and how many kinds of it are conceivable in finding out the accurate meaning of this process, is a matter of significance.

To determine what time means to a subject, it is necessary to clarify the meaning of change. There is a tendency to identify time with the way one measures it and it usually relates to the rotation of the earth around the sun (structurally). The error becomes apparent in situation when astronomical measures do not serve people's purposes well. Ackoff et al. (1972) quote from C. W. Thornthwaite (1953) who sought a biological clock for the problem of the rate of growth of plants and found one in the pea plant. He used time between appearances of successive nodes on the pea plant as units of time. These units were of different duration when measured astronomically, but they made more useful prediction and control of harvests than did hours and days.

"Time is a property of events that is sufficient to enable one individual to individuate any two changes in the same property of the same individual." (Ackoff et al., 1972, p. 252) The same source claims that each event is a change of an individual's nonessential property. It also cites an idea about change in page 256 and writes: "If an essential property of an individual changes, that individual changes to another individual or ceases to exist. An individual changes and remains the same individual when its nonessential properties change. When a subject responds to a change in such a property, he responds to a change in (not of) the individual. Thus, we respond to a change in a friend's clothes, but he is the same friend. Even though two different friends wear the same clothing, we respond to them differently." This is a **functional**, not a **structural** definition of time in their views. Further, they also define momentariness and moment of time to access the right meaning of some orders into set of moments or time-slices to see what gives time its direction. To identify the most difficult concepts like before and after or past and future, there is a quotation from Albert Einstein (1923, p. 1) who believed:

"The experience of an individual appear to us arranged in a series of events; in this series the single events which we remember appear to be ordered according to the criterion of 'earlier' and 'later', which cannot be analysed further. There exists, therefore, for the individual, an I-time, or subjective time. This in itself is not measurable."

But and on the contrary, it is worthwhile to say that when concepts are widely regarded as indefinable, it indicates that they require some kind of very basic reformulation and reorientation. This reorientation will be achieved by dealing with time in functional (structuralistic) not structural (systemic) terms. In this relation, the American pragmatic philosopher Charles Peirce (1923, p. 261) indicates: "Future conduct is the only conduct that is subject to self-control." This suggested to him a functional criterion for distinguishing the past from the future.

"One of the most marked feature about the law of mind is that it makes time have a definite direction of flow from past to future. The relation of past to future is, in reference to the law of mind, different from the relation of future to past. This makes

one of the great contrasts between the law of mind and the law of physical force, there is no more distinction between the two opposite direction in time than between moving northward and moving southward.

In order, therefore, to analyse the law of mind, we must begin by asking what the flow of time consists in. Now, we find that in reference to any individual state of feeling all others are of two classes: those which affect this one (or have a tendency to affect it) and those which do not. The present is affected by the past but not by the future.

If of two states each is absolutely unaffected by the other, they are to be regarded as parts of the same state. They are contemporaneous." (Peirce, 1940, p. 343)

Peirce's insight was that purposeful individuals distinguish the past from the future on the basis of what they believe they can control. Despite his idea about past and future and with respect to the future, the author argues that there are always things their present behaviour can accomplish, but they do not regard their present behaviour as having any potential influence on the past. Ackoff et al. (1972) put forward their tentative terminology and say that **the future (as opposed to the past) is what a purposeful individual takes to be potentially producible by his behaviour**. [See also the discussion about Teleology and Directiveness in Purposeful Systems in (3.B.1.8.)]

Time is important in two ways. For one thing, it is an essential part of reality. Everything real lasts some length of time changing more or less as time passes. An instantaneous moment is an abstract notion, sometimes useful but never real (Waddington, 1977). Waddington refers to Whitehead (1923) and remarks that the present is really the fringe of memory tinged with anticipation. He emphasises on the fact that any attempt to influence the world has to act on the processes which are going on. Temporal change is the basic medium of all activities including human's. For both these reasons, the thesis suggests that an understanding merely of the structure of a living system is not enough; there is a need for understanding it as an interrelated set of processes.

In defining change and transformation, time has been discussed in different sections of this thesis, e.g. in Chapter Three⁴. Here and concerning the model of endogenous development which consists of production process paradigm, it may be fruitful to refer to Purce's (1974) belief that time itself is cyclic and by its returning seasons one reviews the progress and growth of understanding. Therefore, the universe and Man's consciousness (the macrocosm and the microcosm) consist in a continuum and a dynamic whole.

Physicists has demonstrated that matter actually consists in its own movement and organization. The growth of human consciousness is similarly the continuous refining of its own organization, the ordering of its individual microcosm. This process is built into the structure and is inherent in the natural evolution of Man (by repeated breaking down and building up) and it demonstrates the cycles of change within the continuum and the alternation of the polarities within each cycle. It embodies the principles of expansion and contraction (model making⁵) and the potential for simultaneous movement in either direction towards its two extremities (Ibid.).

Another illustration from the same source is about growth and time. So, it refers to the fact that all people's experiences are like that haunting scent: situation recur with almost boring familiarity until one has mastered them in the light of the previous time round. Then, it emphasises on spiral which is the means of travelling round life to compare someone with her/himself and discover how much s/he has changed since s/he were in the city met her/his friend. Purce believes that time is cyclic and by spiral of its returning seasons one reviews the progress and growth of her/his own understanding. She, therefore, propounds a new definition of structural meaning of time in page 8 of her book: 'The Mystic Spiral' and writes:

"Within the totality of the universal continuum, we are limited by space-time to successive and analytic observations of its parts. These parts, the transient formations

⁴ It was discussed directly under the headings such as: Time and Change in Transformation (in 3.A.3.); Irreversible Time and Irreversible History (in 3.B.2.1.); and in the discourse about living systems in System View & Structuralism.

⁵ See the Conclusion of the previous Section: Modelling.

of nature's perpetual motion - although never perfect - seem to us to approximate to an ideal. In so far as archetypal flow and growth form assumed by the mushroom, the embryo and the brain embody a forward impulse which turns back on itself, they demonstrate exactly the forming of a vortex ring."

However, beside these intellectual views, people may have another feeling of time. It is said that in primitive societies or in some independent rural areas, people do not feel time as some feel it in the cities or in institutionalized societies. Time for them has no past and no future. They are sharing subjective aspects and their life has the priority to the other objects. Because, many formation in nature, although both constituted and caused by dissimilar phenomena, are not only similar to look at but have identical description. This would suggest that together they form a higher overall order outside. Therefore, some people live in the momentary present and do not need to measure it by any abstract or artificial instrument. Of course, this moment is a part of a mental process for them which unfolds information from past into future or changes subject into object and the reverse. In the next step, there is an attempt to pull together some elements from different definitions in logic to establish a concept capable for illuminating and proving some of the previous and later concerns about this mental process.

4.B.3. Logical Thinking and The Process

The objective of the thesis, as it was described previously, is to determine the model of endogenous development and its related paradigms, i.e. production process and supply-demand relationship by bringing evidence from scientific (system view and structuralism), logical (deduction, induction and abduction reasoning) and philosophical (cause and effect relationship) background. In Chapter Three scientific issues of different fields of knowledge, such as pure science, sociology, psychology, biology, etc., were discussed which led to the differences between inanimate and animates. In relation to those, the main emphasis was to focus on the differences between human beings and their activities and the other creatures. Now in this section, an attempt has been made to pursue the logical and philosophical bases of the discourse to trace the routes which help solving the problems associated with living systems, therefore, to be able to explain the mechanism of human intentional activities in creating the artificial domain, e.g. in building the environment.

Modern science may be said to be operational: that means it considers every statement as essentially concerned with possible experiments or observable processes. According to this, the study of logic may be reduced to the study of the logical mind which reduces logic to psychology. This is true in the sense that many psychological states and sequences of thought do not conform to the canons of logic. Psychology contains much that is foreign to logic, but any logic which means anything to us can contain nothing without the human mind. Wiener (1948, p. 147) indicates: "All logic is limited by the limitations of the human mind when it is engaged in that activity known as logical thinking."

Describing the logic of design⁶, March (1976) refers to some logical investigations made by Peirce (1923) in order to distinguish the nature of inductive reasoning and its relationship to other modes of logical reasoning. The citation from Peirce indicates: "Let any human being have enough information and exert enough thought upon any question and the result will be that he will arrive at a certain definite conclusion which is the same that any other mind will make under sufficiently favourable circumstances." He also refers to the Aristotelian syllogism which was taken by Peirce:

X is Y; Y is Z: hence X is Z

as typifying deductive or analytic reasoning that is the application of a general 'rule' (y is z) to a particular 'case' (x is y) to give a logically determined 'result' (x is z). But, Peirce says: "inductive or synthetic reasoning, being something more than the mere application of a general rule to a particular case, can never be reduced to this form." In chapter one of his book⁷, March (1976) suggests that the syllogism is isomorphic to the transitivity axiom of a partial ordering, thus,

$X \leq Y$ and $Y \leq Z \rightarrow X \leq Z$,

⁶ Until now, the discussion about development and growth has confirmed that mental process of each individual is the main way of increasing the quality of life. In this process, information generated in past, altering through a structural model, will make a new model of situation. Therefore, management, planning and design which contain decision making, thus problem solving of the existing situation or that of a new image for the future, is helping the completion of a model of situation in determining formation of the society and evolution of thought.

⁷ Theoretic approach is suggested in chapter one, i.e. 'A Boolean Description of a Class of Built Forms, of the book: 'The Architecture of Form' edited by March in 1976 and published by Cambridge University Press.

Peirce goes on to develop two further modes of reasoning by changing the three assertions (Figure 4.B.1). Induction mirrors the reasoner's search for a law to account for regularities among phenomena and engenders new habits of thought⁸; induction is the inference of the rule from the case and the results. Abduction, or what March later calls productive reasoning⁹ and Peirce's third mode, reflects the researcher's presumption that a certain phenomenon might exist to account for his observations given that a particular theory holds: abduction is the inference of a case from a rule and result.

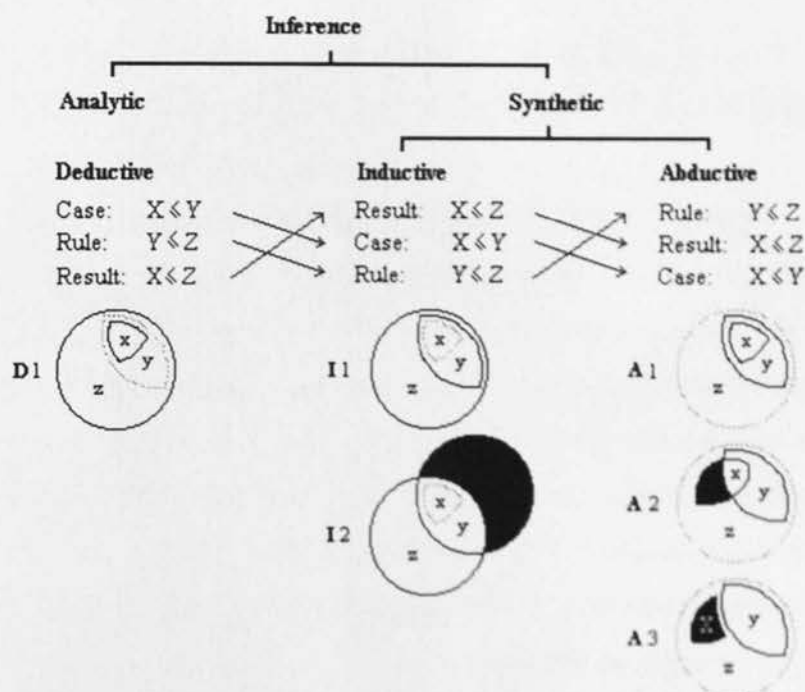


Figure 4.B.1 Peirce's three modes of inference [derived from March (1976)]

According to the suggested diagram, there is one form of analytic reasoning: the deductive, shown in **D1** as logically determined. There are two forms of synthetic reasoning: the inductive and the productive (abductive). The hope in inductive reasoning is to arrive at the conclusion shown in **I1**. However, there is no logical necessity for this and the typical outcome must look like **I2** where the black part of (*Y*) indicates the amount by which the rule ($y \leq z$) is not met. Abductive reasoning has three distinct possibilities. In **A1**, the motive (rule) and the evidence (results) conspire 'beyond all reasonable doubt' to prove the accused guilty (case). In **A2**, more typically, there is a shadow of doubt marked by the black part of (*x*) suggesting the degree by which ($x \leq y$) is not supported. **A3** is yet another possibility. Here, the evidence and the motive simply do not tie up: (*x*), the black zone, is disjoint from (*y*).

⁸ Peirce (1923, p. 15) says: "The belief in a rule is a habit. That a habit is a rule active in us, is evident. Induction, therefore, is the logical formula which expresses the physiological process of formation of a habit." March (1976, p. 35) adds: "In the design context, perhaps, the establishment of a type."

⁹ March indicates that Peirce did not use the term productive: he used at different times the terms abductive, reproductive, presumptive and hypothetical. In the design context, March observes it more telling and natural.

Peirce (1923, p. 135) propounds further description about the above terminologies and says: "Induction is where we generalise from a number of cases of which something is true, Or, where we find a certain thing to be true of a certain proportion of cases and infer it is true of the same proportion of the whole class. Abduction is where we find the some curious circumstance which would be explained by the supposition that it was a case of a general rule and thereupon adopt that supposition. Or, where we find that in certain respects two objects have strong resemblance and infer that they resemble one another strongly in other respects."

Following the discussion, Hartshorne et al. (1931, p. 173 of Vol. 2; and p. 171 of Vol. 5) define these modes of inference in relation with law and cause-effect relationship:

"We usually conceive Nature to be perpetually making deduction This is our natural and anthropomorphic metaphysics. We conceive that there are laws of Nature which are her rules or major premises. We conceive that cases arise under these laws: these cases consist in the prediction or the occurrence of 'causes' which are the middle terms of the syllogisms. And finally, we conceive that the occurrence of these causes by virtue of the laws of Nature results in 'effects' which are the conclusions of the syllogisms. Conceiving of Nature in this way, we naturally conceive of science as having three tasks: **(1) the discovery of laws which is accomplished by induction; (2) the discovery of causes which is accomplished by hypothetic (abductive) inference; and (3) the prediction of effects which is accomplished by deduction.**" [Here, the author's emphasis is especially on induction inference (1) which is a logical support for helping the implementation of the production process by discovery of ultimate/final cause in the Man's intentional productions.]

Then they concluded their discussion by claiming that: **"Deduction proves that something 'must be'; induction shows that something 'actually is' operative; and abductive merely suggests that something 'may be'."**

There is evidence suggesting the analytic approach, synthetic approach, induction and deduction, for example in the Design Process [when induction is employed for making models

and deduction is used for plans in Bax's (1989) writing] and in the General Theoretical Framework of Attitudes of this thesis. Here, the attempt is to show the different applications of these terms in science and in design which has been referred to by March (1976, p. 18). He argues that whereas the major goal of scientific endeavour is to establish general laws or theory, the prime objective of designing is to realise a particular case or design. Both require deduction for analytical purposes. Yet, **"science must employ inductive reasoning in order to generalise and design must use productive inference [abduction] so as to particularise."** [the author's emphasis]

March also refers to 'universality' of inductively derived scientific suppositions and claims that productivity derived designs are 'existential'. Thus, while in science it might behove the scientist to search for a falsifying case; in designing, the problem is to find at least one reasonable design solution. In science, an hypothesis is a general principle induced from particular events and observations, but in design an hypothesis is a particular instance produced from a general notion and specific data. In science, hypothesis is commonly used to mean a tentative general statement about a class of cases, but it originally meant a particular case of a general proposition (Ibid.).

For the purpose of developing a vocabulary for the model of endogenous development and its paradigms and following March's (1976) definition, another discussion has been organized here. March sees the outcome of the productive reasoning as a case which is called design or '**composition**'; the outcome of deductive reasoning as a '**decomposition**' which contains the characteristics of the design that emerge from analysis of the whole composition; and the outcome of the inductive reasoning as a '**supposition**', a working rule of some generality - that is an hypothesis in the scientific sense and more loosely, an idea, a theory, a model, or a type. To rephrase Peirce's above remarks, Martin et al. (1972, pp. 164-74) conceive the rational designing as having three tasks:

1. the creation of a novel composition which is accomplished by productive reasoning; [similar to the concern of this thesis which is based on people's (consumers) participation in design process to help them as users to feedback the results of the

process (products) into its start point (subjective cause) for its qualification.]

2. the prediction of performance characteristics which is accomplished by deduction; (a theoretical part of the production process starting from subjective cause onward, i.e. subjective cause, objective cause/effect and formal cause/effect) and
3. the accumulation of habitual notions and established values, an evolving typology, which is accomplished by induction. (Similar to the philosophy of design indicating the necessity of ultimate/final cause in the production process which involves four stages and causes the emergence of cultural values that is discussed in the followings.)

Finally, while it is from the collusion of specific needs and wants that novelty is produced, it is productive reasoning which can frustrate the established order of habit and consequently inject new values. Hartshorne et al. (1931-5, p. 475 of Vol. 6) quote from Peirce and writes that: "abduction [March calls it production] is the only logical operation which introduces any new ideas; for induction does nothing but determine a value; and deduction merely evolves the necessary consequences of a pure hypothesis¹⁰." March (1976, p. 18) gets a result from this citation and proposes a statement, which is also the author's emphasis in the discussion about production process of the model of endogenous development. He claims: "**Production creates; deduction predicts; and induction evaluates.**" Therefore, the acceptance of the social evolution of thought and consequently of design as a rational process for the development and transformation of the society becomes possible from this point of view. The scientific and logical references mentioned so far aim to help responding to the question of 'how the process of being in natural and artificial domain is conceivable?'. Further exploration of these concepts requires finding a philosophical answer to the critical question of 'why the production process of the endogenous development is so important?'

4.B.4. Philosophical Foundation (Cause-effect) and the Process

Without going into detail and regarding the different schools of philosophy of science, it is

¹⁰ The source also contains the expression: "**Deduction explicates; induction evaluates.**"

necessary to describe some trends which pertain more directly to this discussion. For instance, some scientists believe that when the whole to be explained could not be disassembled into independent parts, the relationship between them had to be understood in order to understand the whole. Consistent with reductionism, it was believed that all interactions between objects, events and their properties could be reduced by analysis to one fundamental relationship: 'cause-effect'. One thing was said to be the cause of another, i.e. its effect, if the first was both necessary and sufficient for the other. An effect could not have occurred unless its cause had. For example, if striking a bell is considered necessary and sufficient for it to make a sound, then the strike is taken to be the cause and the sound to be its effect.

It was also believed that becoming (equal to the necessity) of every existence (equal to existence and nonexistence) emerges from another being (a cause). In other words, an existence should have a cause. The great Iranian scholar and philosopher S. M. Hossein Tabatabaei (1953) propounds a comprehensive discussion about cause-effect relationship and says that every phenomenon or event in the world has deterministic existence and has come to being by a chain of causes. If there were not those causes, there would not be that phenomenon. Therefore, the existence of 'cause' is the cause of 'effect' and nonexistence of cause is the cause of nonexistence of effect. Hence, object needs subject.

The same source referred to the main privilege of a human being, compared to an animal, is that s/he can have knowledge of her/his knowledge or her/his ignorance. Theologians claim that this is the main privilege which separates Man from animal. Therefore, animal lives in double ignorance or in concrete knowledge. But, human can have concrete ignorance and complex knowledge. On the contrary to what majority of philosophers say, Tabatabaei claims that it is not only the capability of Man's mind in abstracting and contracting information, but also being aware of four general concepts referred to in philosophy:

1. being and lack of being;
2. necessity and possibility;
3. unity and diversity; and
4. cause and effect relationship.

Although, these terms are being used in philosophy rather than in an everyday life, but they do not entirely lose their everyday usage. Everybody is dealing with some absolute principles and beliefs. For instance, a person knows that four times five is equal to twenty. S/he believes in this rule and knows that there is no other possibility. So, s/he believes that this is necessary. If people do not have clear idea about this 'necessity', they cannot make any comment in any occasion. These general concepts are self-evident facts and axioms. They are all significant tools for human thought (Motahhari, 1953). Motahhari also tries to define different interpretations of cause and effect relationship and classifies such attitudes:

- a) the majority of philosophers who believe that all effects need causes both in occurrence and in permanency;
- b) some scientists, according to their recent discoveries, who claim that effects need causes in occurrence not in permanency, but the continuum of effect in permanency is deterministic and necessary (process); and
- c) some Iranian philosophers (Motekallemin) who reject the need of effect to cause in permanency and do not agree that cause and effect relationship is deterministic. They have claimed that effect does not need cause neither in occurrence nor in permanency.

Motahhari pinpoints the arguments between materialists and theologians about the existence of cause-effect relationship and their beliefs about the existence of cause after the occurrence in the permanency of effect and indicates that proving the consistency of effect without cause in such examples as the existence of building after builder, child after parents, clock after factory is not accurate and scientific. He believes builder, parents and factory are not the real causes. They are subjects that form the physical, chemical and vital circumstances by their activities. Therefore, they are causes of a series of systematic and regular activities [process]. He claims that these examples have nothing to do with philosophy and should have scientific answers. In philosophy cause-effect relationship has a specific meaning. Causality, no matter how it is defined, is believed by Mayr (1970) to contain three elements:

1. **an explanation of past events; ('a posteriori causality')**
2. **prediction of future events; and**
3. **interpretation of teleological issues. (That is 'goal-directed' phenomena)**

Materialists claim that cause dies when effect occurs. **They also claim that time is the only factor which can illuminate the relationship between cause and effect;** which there is no interval time between them. Thus, they claim that cause disappears when effect emerges. Motahhari (1953) believes that time is not a choice for Man in his activities, because choice is possibility and determination is necessity and world is made of necessities not possibilities. He also categorises different attitudes towards the definition of determination and free will:

- a) absolute determinists; (who, appear occasionally and do not have a specific school, believe that all Man's activities are deterministic and there are no choice and free will for him. So, Man is not responsible for his behaviour.)
- b) contemporary determinists; (who believe human behaviour is deterministic and there is no choice and free will for him but responsibility and duty are acceptable.)
- c) some Motekallemins and scientists in modern physics; (who reject the deterministic cause-effect relationship and say that there is no 'necessity' in the world. Therefore, there is no 'necessity' which dominates Man's activities. Cause-effect and its necessity are just considerable aspects in material. Non-materials (spirituality and God) are subjects not causes. They also believe that the relation of effect to cause is 'necessary', but the relation of activities to subject is not necessary.)
- d) some psychologists; (who believe that there is no 'necessity' and 'determinism' which dominates human's activities because Man acts by 'will' which is free of causality.) and
- e) Islamic thinkers. (Who believe that the structure of the world is based on 'necessity'. Man is entirely free to act and there is no contradiction between his free will and the necessity of universe.)

4.B.4.1. Things View and Process View

There are two great philosophical alternatives which are concerned with the somewhat intellectual picture people have of the world of nature. One view is that the world essentially consists of 'things' and that any changes one notices are really secondary arising from the way things interact with one another. The alternative is that the world consists of processes and that the things one discerns are only stills out of what is essentially a movie. These alternatives go back to the earliest Greek philosophers who lived before Socrates (about 600-500 BC). The 'thing' view is usually associated with the name of Democritus who actually used the word 'atom' as the name for the basic things - invisibly small unchangeable and unchanging little lumps of something which could be called matter, though they were not quite the same as what a modern chemist or physicist would call an atom. The classical spokesman for the other view was Heraclitus who argued that it is an essential feature of things that they are always in the process of change like a flame into which burnable substances pass are burnt and hot gases come out. One can never step into the same river twice, said Heraclitus, for the water is flowing and when you step into it again tomorrow it will not be the same water as it was when you stepped in today (Waddington, 1977).

Conventional Wisdom of the Dominant Group (COWDUNG, 1938-1958) argues that the world and everything in it is constituted from arrangements of essentially unchanging material particles whose nature has already been largely discovered by the researches of physics and chemistry (Ibid.). This view, when applied to living things, was known as 'mechanism' in the early years of this century. The human being was regarded as a very complicated machine built up of these physio-chemical parts. A few pointed out that there are many properties of living things such as their development, their evolution, their apparent organization and particularly their consciousness and it was claimed that living things must involve some other type of principle: a 'vital force' of some kind. This view is known as 'vitalism'. The same source indicates that Needham and Woodger, two British biologists, argued that living systems are made up of the physico-chemical entities plus what they called it 'organizing relations' (comparable to what would sometimes be called cybernetic relations) between them.

Because of progress in understanding the nature of networks of interaction which are involved

in the process by which a collection of cells becomes organized into an organ with a unity character or into a neural system capable of functioning in a coherent way, some biologists spoke of a process of 'emergence' of new properties at certain 'levels of complexity'. By this, they meant that a complicated mechanism, made up out of physico-chemical parts, might exhibit a type of behaviour which did not and could not occur in the isolated part (Ibid.).

There is another view which regards physico-chemical entities as a source of knowledge for understanding the world and returning to Heraclitan 'process' philosophy. This is opposed to Democritean 'thing' view and anticipates Marx and Engels. They were perhaps the first influential exponents of an approach of this kind. They tried to substitute a dialectical materialism for the mechanical materialism (Waddington, 1977). In a similar line of thought and more in relation to the natural world as a whole and our knowledge of it, Whitehead (1923) pointed to a new determination of knowledge and argued that the foundation of knowledge is not the atom, as chemists describe it or whatever fundamental particles the most recent physicists are willing to admit. Instead science is based on observations which made in a controlled and organized way amount to experiment. Now, an observation or an experiment has to be observed by someone. It is '**an occasion of experience**', and involves the experiencing person as well as what is experienced. Thus, phenomena like mind or conscious perception are included in the very foundation of knowledge.

The problem of causality, previously mentioned, is most complicated when it is associated with those who have a process view of the world. Therefore, there is a need to find the causal relationship through change and by being concerned about time. Sometimes, process has been used as one can perceive it in natural phenomena without necessarily being dependent on the ultimate cause (e.g. probabilistic cause-effect has been used to obtain this goal). Some seek the process after the occurrence of cause [generative/evolutionary cause-effect related to the deep structure (diachronous domain) and surface structure (synchronous domain) of epistemology show this claim]. The author argues that the initial problem is about the different interpretations of 'cause'. It seems that there is a tendency to substitute the subjective cause with ultimate cause, rather neglect it, by emphasising on theories. To prove this, the author would like to refer to some definitions about different kinds of causality.

4.B.4.2. Different Types of Causality

Describing the difficulty associated with the concept of causality in biology, Mayr (1970) propounds an example of bird migration. He listed four equally legitimate causes for this migration: **ecological; genetic; intrinsic physiological; and extrinsic physiological causes**. There is an immediate set of causes of the migration consisting of the physiological condition of the bird interacting with photo-periodicity and drop in temperature. Mayr calls these the '**proximate causes**' of migration. The other two causes: the lack of food during winter and the genetic disposition of the bird are the '**ultimate causes**'. For him, these are causes that have a history and that have been incorporated into the system through many thousands of generations of natural selection. Evidently, the functional biologist would be concerned with analysis of the proximate causes, while the evolutionary biologist would be concerned with analysis of the ultimate causes (Ibid.). This classification is assumed by the author to be applicable in determining the mechanism of design process in artificial domain, i.e. using a functional approach to define the design process which is concerned about the designer's work while an evolutionary approach is concerned with tradition and culture as the historical backgrounds of design process. The former is considered to be proximate cause including subjective cause, objective and formal cause/effects and the latter is ultimate/final cause which can accommodate the result of feedback control of the process (by employing inductive reasoning to help generation and evolution of values).

The same source modifies the terms given above by saying that proximate causes govern the responses of the individual (and her/his organs) to immediate factors of the environment while ultimate causes are responsible for the evolution of the particular DNA code of information with which every individual of every species is endowed. To find out how the definition of cause in formal philosophy fits with the usual explanatory 'cause' of functional and evolutionary biology, Mayr (1970, p. 46) argues that there is a need for the definition of "cause as 'an insufficient condition without which an event would not have happened', or as 'a member of a set of jointly sufficient reasons without which the event would not happen'."

The interactions between objects, events and their properties are the major point in science of organization. In Machine Age, cause-effect was the central relationship by which all actions

and interactions were explained. Singer (1959) noted that cause-effect was used in two different senses. First, it was used in the sense when a cause is necessary and sufficient condition for its effect. Second, it was also used when one thing was taken to be necessary but not sufficient for the other. For instance, an acorn is necessary but not sufficient for an oak; various soil and weather conditions are also necessary. Singer referred to this second type of cause-effect as 'producer-product'. It has also been referred to as **'probabilistic or non deterministic cause-effect'**. Because a producer is not sufficient for its product, other producers (coproducers) are also necessary. These constitute the producer's environment. Hence, the producer-product relationship yields environment-full (open-system) not environment-free (closed-system) thinking (Ackoff, 1974).

Singer (1959) went on to show why studies that use the producer-product relationship were compatible with, but richer than, studies that use only deterministic cause-effect. Furthermore, he showed that a theory of explanation based on producer-product enabled objective study of functional, goal-seeking and purposeful behaviour. The concept 'free will' and 'choice' were no longer incompatible with mechanism.

Ackoff (1974) indicates that **in mechanistic thinking behaviour is explained by identifying what caused it, not by its effect. In teleological thinking behaviour can be explained either by what produced it or by what it produces or is intended to produce.** For example, a boy's going to the store can be explained either by his being sent there by his mother or by his wanting to buy ice cream. He says that study of the functions, goals and purposes of individuals and group has a greater ability to evaluate and improve their performance than did the study of them as purposeless mechanisms.

4.B.4.3. Final Cause and Finality in Purposeful Systems

'Final cause' was among the Aristotle's classification of causes. This category is based on the observation of the orderly and purposive development of the individual from the egg to the 'final' stage of the adult and of the development of the whole world from its beginnings to its present order. Therefore, he defined final cause as 'the cause responsible for the orderly reaching of a preconceived ultimate goal'. All goal-seeking behaviour has been classified as

'teleological'. Aristotelian scholars have rightly emphasized that Aristotle was first and foremost a biologist and that it was his preoccupation with postulate '**final causes**' in addition to the '**material**', '**formal**' and '**efficient**' causes (Mayr, 1970). Thinkers from Aristotle to the present have been challenged by the apparent contradiction between a mechanistic interpretation of natural processes and the seemingly purposive sequence of events in organic growth, in reproduction and in animal behaviour.

Some biologists believe that the purposive action of an individual, in so far as it is based on the properties of a genetic code, is neither more nor less purposive than the actions of a computer programmed to respond to various inputs¹¹. Those biologists felt that it is ambiguous to designate such programmed, goal-directed behaviour 'teleological', because the word 'teleological' has also been used in a very different sense for the final stage in evolutionary adaptive processes. When Aristotle spoke of final causes, he was particularly concerned with the adaptations found throughout the plant and animal kingdom. He was concerned with what later authors have called design or plan. He ascribed the final causes not only imitation or cooperation but all the other adaptations of animal and plants to each other and to their environment. The Aristotelians and their successors asked themselves what goal-directed process could have produced such a well-ordered design in nature.

The terms 'teleology' and 'teleological' have been applied to two different sets of phenomena. Mayr (1970, p. 49) explains: "On one hand is the production and perfecting throughout the history of the animal and plant kingdoms of ever-new programmes and of ever-improved DNA codes of information. On the other hand, there is the testing of these programmes and the decoding of these codes throughout the lifetime of each individual." He also claims that there is a fundamental difference between end-directed behavioural activities or developmental processes of an individual or a system which are controlled by a programme (instinctive process) and the steady improvement of genetic codes (evolutionary process).

In order to avoid confusion between the two entirely different types of term for all end-directions, Pittendrigh (1958, p. 394) has introduced the term 'teleonomic' as a descriptive

¹¹ Mayr (1970) claims that it is a purely mechanistic purposiveness.

term for all end-directed systems 'not committed to Aristotelian teleology'. Not only does this negative definition place the entire inconvenience on the word system, but is useful as it restricts the term 'teleonomic' rigidly to systems operating based on a programme, a code of information. In this regard, Mayr (1970, p. 49) states: "Teleonomy in biology designates 'the apparent purposefulness of organisms and their characteristics'." [See also (3.B.1.7.), (3.B.1.8.); and (3.B.2.4.) in Chapter Three]

In his conclusion: page 54, Mayr (1970) admitted that the existence of complex codes of information in the DNA of the germ plasm permits teleonomic purposiveness. Saying that, he continued: "... evolutionary research has found no evidence whatsoever for a 'goal-seeking' of evolutionary lines as postulated in that kind of teleology which sees 'plan and design' in nature. The harmony of the living universe, so far as it exists, is an a posteriori product of natural selection." But, the author suggests that the built environment is different from organisms in that there could be an overall 'plan'.

Once any process is set going (for example, if two chemical substances are allowed to start reacting with one another), it will eventually reach some end. The question of 'finalism' arises when there is something interesting about the end - in particular, when it is both complex and definite in character. Mayr (1970) considered the former causality being as teleological or vitalistic and the latter 'teleonomic' or in the phrase of Waddington (1957) 'quasi-finalistic'. Waddington (1962, p. 55) distinguishes three main types of explanation available for finalism:

1. that the end itself acts as a cause directing the process so that it terminates at the predetermined end state; (this is Aristotelian finalism, which is rejected by some biologists such as Waddington (1962), because they claim it involves a concept of causation quite outside of their accepted range of idea.)
2. that some nonmaterial agency directs the process to the predetermined end; (this is 'vitalism', which has been also rejected by the same group.) and
3. that the end state of the process is determined by its properties at the beginning. (This is 'mechanism', the experience of which is said to led those biologists to realize that it is a powerful type of hypothesis, e.g. computers.)

Tabatabaei (1953) says: "Each object has a subject or each effect needs a cause." He claims that existence of any phenomenon which needs 'cause' will not be attainable without 'subjective cause', even if it has other kinds of causes, i.e. 'ultimate cause', 'objective cause' and 'formal cause'. **Subjective cause without ultimate cause is potential subject but not actual one. Therefore, it is incomplete. It will be final subject by ultimate cause**

All people's activities aim for perfection. They are hungry so they seek fullness by eating food. They are thirsty so they look for satiation by water. They are defective so they seek perfection by ultimate activities. In simple words, the relationship between 'ultimateness' and those who are 'subjects' is similar to the relationship between 'perfection' and 'deficiency'. Perfection is a dominant role in nature. All the subjective causes are accomplished by the ultimate causes. Therefore, every perfect being is an ultimate result of its previous deficient position (Ibid.). [See Philosophical Background in Section (m) of Appendix One.]

On leaving natural settings for conditions of human creation, a person entered a process through which s/he has been diminishing the role of natural selection as a force in her/his evolution. At the same time, s/he entered a process leading to the creation of conditions that can challenge subjective 'well-being' and biological adaptedness. The human-nature transaction is a long running process in which natural selection and culture have come to play mutualistic roles (Dobzhansky, 1962; and Dubos, 1965). In other words, the human-nature transaction (similar to the production process paradigm) has two consequences; the evolution of thought (individual or that of society) and the generation of typologies in changing the condition (natural and artificial). Accordingly, the information of all these activities passes through cognitive structure of her/his mind.

Two different ways, in which environmental information is processed, have been acknowledged by psychologists. One way via the cognitive areas of the brain which registers thoughts and meanings; the other way is by a direct link from the sensory receptors to the more primitive areas of the brain which bypasses cognition. Aspinall (1996) made a brief review of Parsons who has provided a summary of the behavioral and neuropsychological evidence. He says that the cognitive structure of the emotional model to be developed, relies

on the work of Ortony et al. (1988) which starts from the view that people have structures of goals, interests and beliefs which underlie their behaviour. It is values associated with these elements which become the source of emotional appraisals. The model focuses on three major aspects of the world or changes in the world underlying perceptions. These are: events (process); people or agents (producers); and objects (products). when in perception the focus is on events it is because of interest in their consequences; when the focus is on agents it is because of their actions and when the focus is on objects it is because of their properties. Agency can be ascribed to institutions or to inanimate objects construed as agents (or secondary causes), e.g. a person blaming his car for a series of misfortunes or a product demanding for more work to be appropriate. As goals and needs play a significant role in processing human behaviour in intentional changes of artificial domain, a brief discussion about them has been conducted in Appendix One: Section (n) which is about Propensities and Opportunities to Engage in the Process, i.e. goals, purposes, needs and wants.

4.B.5. Production Process Paradigm

All the time, human being is refining information from dissipation into the unity. Human's cognition or the mechanism of her/his reserving is from unconscious to conscious, from dissipation to classification, from surface to deep structure, from information to symbol and instruction, and from knowledge to belief. These steps move from multiplicity of her/his products into the unity of her/his experiences and knowledge and vice versa. This is made possible by an alive, natural and cyclic process. The process which brings order out of nothing but ourselves. It is not just a process of addition in which preformed parts are combined to create a whole, but is also a process of unfolding like the evolution of an embryo in which the whole precedes the parts and actually gives birth to them by splitting.

A brief review of the history of technology¹² indicates that even development and utilization technology, in which preformed parts are combined to create a whole, requires an understanding of the mental processes that are involved in it. Many interdisciplines have been developed to generate understanding of these mental processes. These interdisciplines include cybernetics; operation research; the behavioural, communication, management and policy

¹² See Historical Background of Production Process in Section (o) of Appendix One.

sciences; systems engineering; and planing and design, etc.

Many consider process as different sets of changes either in a synchronous domain (generation of typologies) or in a diachronous domain (evolution of theories) without concern for the causal relationships in the correspondence between the two. The thesis's proposal is that it is possible to open out a 'space' between the territories of cause and effect. Into this opened out space can be fitted a sense of intention where goals (ultimate/final causes) become mediated through this space into objects or typologies (formal/externalized cause/effect). By this means, it is possible to see process orientated temporal elements similar to the process of becoming seen in the purposeful systems. This is 'production process' which relates to Man's creative power of changing, to some extent, subject into object, nonexistence into existence, multiplicity into unity, necessity into possibility and vice versa (Figure 4.B.2).

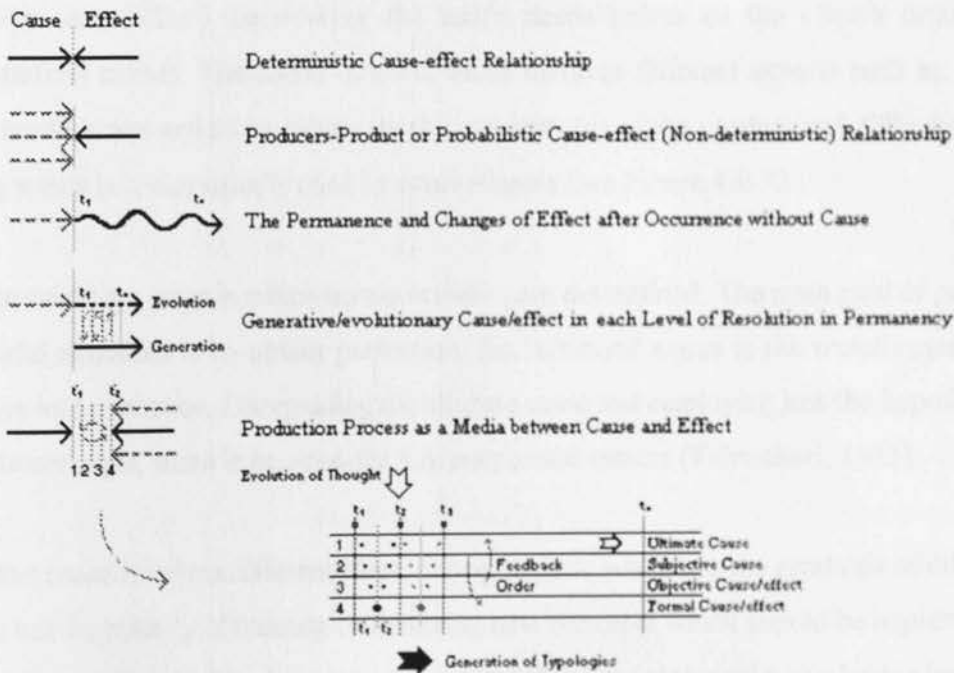


Figure 4.B.2 Different interpretations of cause-effect relationship

The diagram illustrates different kinds of cause-effect relationships in which production process, by emphasizing on ultimate cause, is the author's proposal and the thesis's concern. Generative/evolutionary cause and effect, which has been proposed by Hillier et al. (1972-73) using theory as subjective cause and denying ultimate cause, is seen potentially but not actually a process.

Source: the author

The stimulus of production process is human's intention which is strengthened by her/his

knowledge, experience of the previous activities, opportunities and availability of the resources. The sort of knowledge embedded in this kind of productivity is responsible for the evolution of each individual or society's thought and generation of the products (Islami, 1996a, 1997c). The process is considered by the author to have four stages:

1. ultimate/final cause; (e.g. an end: a purpose, a goal, a want and a need)
2. subjective cause; (e.g. agencies: theories, concepts and professionals)
3. objective cause/effect; (e.g. a means: situations, conditions and circumstances) and
4. formal/externalized cause/effect. (e.g. products)

Each goal or need that is chosen to be satisfied requires a means in order to be changed by an expert into a new product. For example, in designing or building a house (formal cause/effect), an architect or a builder (subjective cause) designs or changes the means (objective cause/effect) considering the user's needs/desires or the client's ordinances (ultimate/final cause). Therefore, ultimate cause involves different aspects such as: goals, values, needs, wants and so on, which are the real stimulus of the product and differ from the briefing which is a way usually used by professionals (see Figure 4.B.5).

'Ultimate cause' is a stage in which human activities are determined. The main goal of people's purposeful activities is to obtain perfection. So, 'ultimate' cause is the transformation of deficiency into perfection. Disregarding the ultimate cause and employing just the hypothetical scientific concepts, there is no need for any purposeful system (Tabatabaei, 1953).

'Subjective cause' involves different rules, concepts, etc., which are the synthesis of different cases. It has the potency of creating or deducing new concepts which should be implemented in the third stage that of objective cause. This stage of the process works as a bridge between subject and object and operates such as planing, designing, management or a problem solving processes. It has been considered to be a place for adapting to the theoretical issues¹³, i.e. a part of the mental process and the last stage of the human conceptual framework.

¹³ The hierarchy of this conceptual framework of the attitudes can be set up as the following order: theological; juridical; political; cultural; and theoretical. This hierarchy has been also referred to in Figure 4.B.3.

The model of endogenous development indicates that 'objective cause/effect' is a stage which involves all kinds of objects, e.g. time, energy, technology, labour power, ecology, natural resources, nature, artificiality, those resources which are means or ends of other processes, etc.¹⁴ For instance, employing people in this stage may help generating the typologies of the products but will not necessarily affect the evolution of their thoughts. This evolution is possible when they can participate in all the phases of the production process, either by pursuing their demands and predicting the products which is accomplished by deduction or by discovery of their usefulness or their values which is accomplished by induction. If people are producers rather than consumer they can also participate in the process by discovery of the roles of its different causes which is accomplished by hypothetic (abductive) inference to particularise its design processes. In fact, people's abductive operation will help the creation of new products; their deductive operation will help prediction of implementing a plan or a design and their inductive operation will help them to evaluate the products or the process of production itself.

Two points are important in the proposed model of production process. First for processing a product, there is a need for all four stages to work together. Secondly, the process generates a wide range of typologies of products, materialistic or non-materialistic. The production process is possible over a period which can be categorized into chronologically time (when the concern is about the generation of typologies), evolutionary time (when the concern is about the evolution of the values and theories) and deterministic time which is irreversible and is either long run or short run according to the ends and the means. Endogenous development becomes possible only if this process is people centric and the organisation incorporates the cooperation of each individual's creative power and that of society.

Production process involves mental process that evaluates the results of the production process. This model may help having better understanding of producing-product relationship which is not deterministic cause-effect. It is a good tool to analyse the concept of feedback in purposeful and goal-seeking systems, the mechanism of control by evaluating the situation,

¹⁴ There is also a difference between an object and an objective cause. The reason why 'cause' has been used for object (i.e. objective cause) is that between an object and its form, this is the object which 'accept' the form. (See also the definition about resources in the Introduction to Development in Chapter One: 1.B.)

adapting to and learning from the environment, free will and free choice in open systems specially in human societies that cause evolution and transformation of society by flourishing values resulting from the experiences of producing and testing the products.

The feed-back control is more adapted to this domain which shows the flexibility of natural and intentional processes. The evolution of scientific theories in subjective cause (deep structure in epistemology) should be replaced by evolution of thought when people attempt to go to deeper parts from theory to culture, politics, juratory and theology. This might results the evolution and changes in culture and its values which is the main product and the result of the process. In fact, there is a difference between the process whose principles are instrumental and start from subjective cause and the process whose principles are symbolic and start from ultimate cause. The first is concerned about growth and generation of typologies in products being assisted by the industrial technologies, so creates good-centric organizations. The second is about development and evolution of thought using the endogenous strategies in production, so creates people-centric organizations (Figure 4.B.3). [See also the author's discussion about Good-centred and People-centred Organisations in Section (p) of Appendix One.]

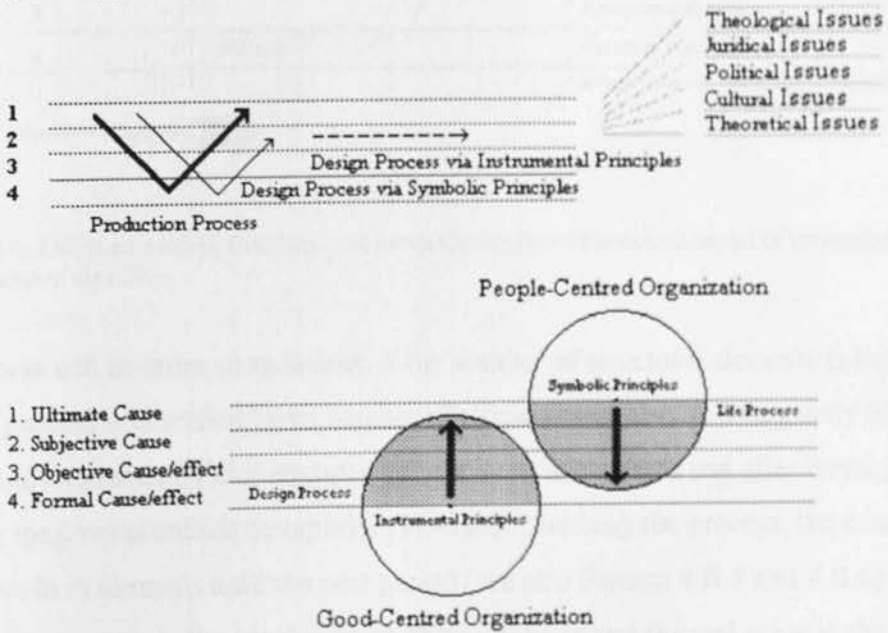


Figure 4.B.3 The diagram shows that employing symbolic principles qualifies the process of life and operating instrumental principles progresses the products
Source: the author

Each cycle of the process occurs while time passes. Therefore, at (t_1), after identifying a need or a want, an ordinance starts the process. Then an expert, using a concept which is the briefing of that need or want, ladders down the stages of the process (analytic approach) to find or innovates solutions (which is accomplished by deductive reasoning) as products. Apparently, information about the product will be controlled by a feedback mechanism, stage by stage, to evaluate the results of the process (synthetic approach). As time passes, the results of this process confront the need(s) or want(s) at (t_2), hence promote and evolve the structure of thought. In this regard, each product will be evaluated in different stages of the production process: for its adaptation to the environment by both users and designers in the third stage; for its design quality by designers, clients and sometimes by user's participation (abduction reasoning) in the second stage; and for its symbolic or instrumental values by users themselves (induction reasoning) in the first stage (Figure 4.B.4).

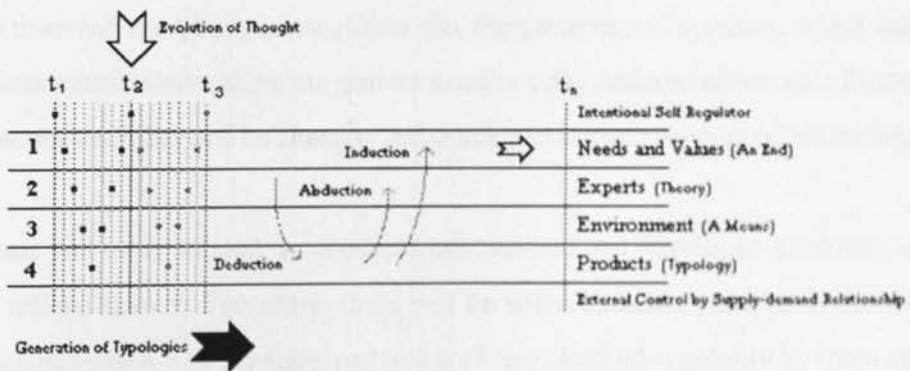


Figure 4.B.4 Direct interaction, functional and internally structured theoretical model of 'production process'
Source: the author

The process will be more complicated, if the number of structural elements is increased. In fact, any process is identified by its number of elements and also by its capacity of elements' transformed information. After contacting the structural elements and after forming the joint point (t_2), the process unfolds its capacity. Then after finishing the process, the consequences will reserve in its elements until the next period (see also Figures 4.B.5 and 4.B.6). The start point of any process is the contact point of its elements and the end point is the point just before the start point of next period. This point is a determinative point of some process. But, in industrial production the results of the process (products) are seen as the ends and are secondary cause for the new processes, e.g. a car, which is a device for helping transportation,

has had many different influences in the other aspects of life.

As each evolutionary process occurs in a certain time and the time is cyclic, events are always repeated. So, any phenomena returns to the starting point constantly, but with this difference that it has finished one period and is waiting for the new one. Apparently, the values of this point will change during the processes and get a high or low rate of values. Therefore, the process on the way back to starting point may gain, lose or maintain the same value.

The obtained patterns of the moments of elements' meeting repeat frequently in terms of the other meeting with the other elements. They are always checked and developed until to repeat again in their prior origin part of themselves in order to create new patterns emerging from their repetition. Gradually, some of these patterns are become more stable and they are repeated regularly. This regularity will be extent up to the point that there is no need to introduce them and everybody knows them. So, the patterns and symbols, which are used to explain phenomenal relationships, are characterised in a physical and observable forms and are become eternal until they will be changed and developed in their process of becoming perfect.

The process will be continued, so products are checked and developed gradually until they gain the official favour. Therefore, there will be some constant patterns in the main core (ultimate cause) which new emerging patterns are being checked regularly by them according to their new communications. New management and policy are chosen and applied by the cooperation of whole members (either human's organisation or elements of mould). The path to consciousness has to be seen as a return along the same path; the return is a continuation. At the point of maximum contraction and expansion begins. Purce (1974, p. 32) claims: "The spiral tendency within each one of us is the longing for the growth towards wholeness. Every whole is cyclic and has a beginning, a middle and an end [the process]. It starts from a point, expands and differentiates, contracts and disappears into the point once more."

Ordinance concentrates the attentions of different activities towards producing a product and demand for that pulls the results gradually towards the starting point. These two opposite directions which follow one another and have different functions perform in a cyclic way. This

mechanism is applicable to all the human activities. The implementation of each concept is as important as evaluating the results. This evaluation accommodates knowledge which is one of the main resources for change and evolution of the structure of human thought and society. (See the discussion about Logical Thinking and the Process in this section: 4.B.3.)

Each product needs a certain time to be processed (deterministic time). By appearance of each product the time will stop until another attempt starts it again in order to evaluate that product. Although, progress of the products seems to be the result of changes in a synchronous domain which brings diversity of commodities, but it relays mostly on the process itself whose function is in a diachronous domain and generates evolution of thought (evolutionary or structural time). Furthermore, for perfection of a product, it is also necessary to start another cycle of the process to generate a new product which can be more sophisticated than the previous one (chronological time). Setting a diagram to illuminate these cycles may help undertaking a new meaning of time and transformation in human intentional activities which may also have the same application in alive systems (Figure 4.B.5).

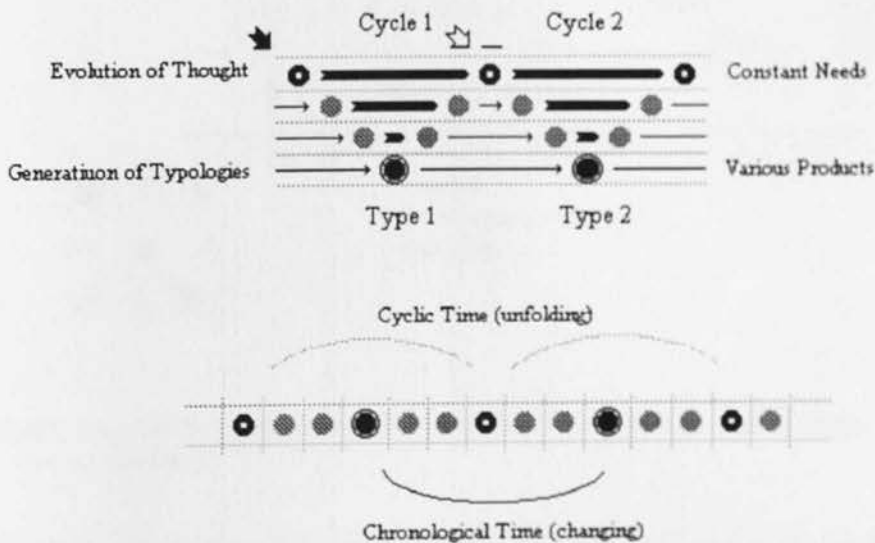


Figure 4.B.5 There are three types of 'time' involved in the process: evolutionary time in which values and culture change; chronological time which is about progress of typologies of products; and deterministic time which is irreversible in each cycle.

Source: the author

The above diagram shows that each component of the production process is a time dependant

phenomena, as well as the flow of the process, for adapting to and learning from the others in order to perform well. For instance, architects (which play their roles in the second stage of the process) should compare themselves with their previous position and predict their future roles in terms of their proficiency. They should also consider the users' needs and wants (which are considered to be the starting point in the first stage of the process) in different times: when the demands were launched; in the time when architects are making decision and preparing their designs; and in future when the users are supposed to deliver the products. Architects are also concerned about the evaluation of the means (which are seen in the third stage of the production process) in past, present and future (Figure 4.B.6).

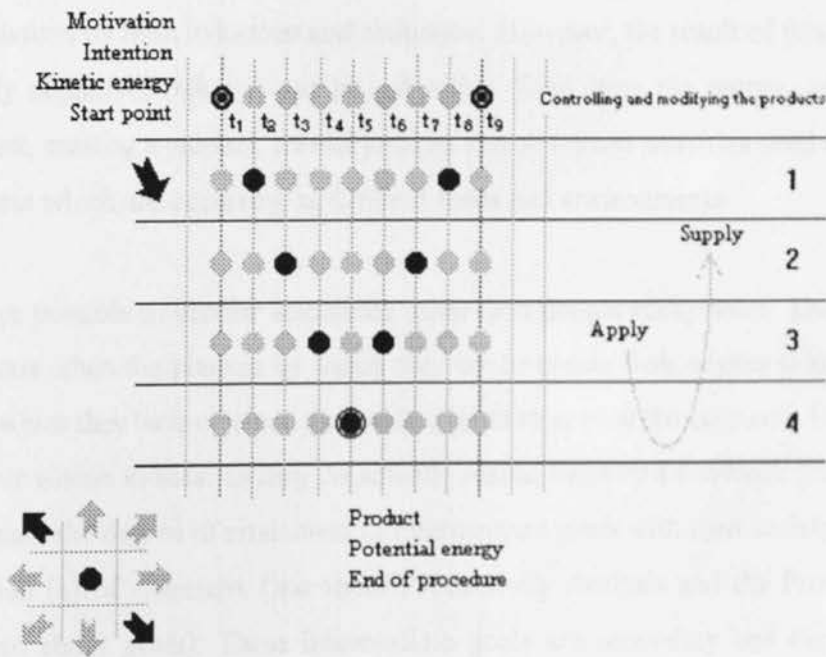


Figure 4.B.6 Time and the process create different situation for each component of a system.
Source: the author

It is necessary to consider the artificial domain (which is located in the forth stage that of formal cause/effect) in different states and different time. Meanwhile, all the performances from (t_1) to (t_9) in different stages of the production process (1, 2, 3, 4) have actual existence and their influences on the process directly and/or indirectly. In this cohesion of actions and interactions, philosophy and world view play a significant role for identifying the relationship between users and producers. The relationship between object and subject, deep structure and

surface structure (diachronous and synchronous domains), learning and adopting, mechanism and function, progress and evolution, growth and development, etc., can be explained by this process which is one of the two paradigms of the model of endogenous development.

According to the statement 'each cause is the effect of its own effect', each product (in the last stage of the process) is an 'effect' of different causes located in the other three stages (i.e. ultimate cause, subjective cause and objective cause/effect) of the first loop of the process and is a 'cause', in return and in the second loop, which affects the means, human's creativity and cultural values and beliefs. Laddering up to the subjects from object (i.e. feedback control in systemic view) help users to evaluate the process of production and its product and is accomplishment by both induction and abduction. However, the result of this process is not necessarily objective, rather it can be subjective. Exploiting the nature, adapting to the environment, creating a product, mental process and all human activities need different kinds of processes which are occurring in different fields and environments.

It is always possible to ask for something other than people really want. This possibility is most serious when the process by which they are to obtain their wishes is indirect and the degree to which they have obtained their wishes is not clear until the very end. Usually, people realise their wishes insofar as they do actually realise them by a feedback process in which they compare the degree of attainment of intermediate goals with their anticipation of them [see Section (q) of Appendix One about Productivity Analysis and the Process for more clarification about goals]. These intermediate goals are secondary and the result of the communal activities, usually exist in an independent and self-sufficient society within which nonessential properties such as the effect of different sectors (agriculture, industry and service sectors) and their relationships play a significant role in activating people's productive power. To clarify this, the next section aims to emphasise on 'supply-demand' relationship as the second paradigm of the model of endogenous development and to pursue the relationships between the end-products of different processes of production in synchronous domain.

4.B.6. Supply-demand Paradigm

Supply-demand relationship is an expression of series of activities in society which are

happening in its surface structure which produce and influence many other activities in the deep structure of the society. This can be seen also as a secondary cause in forming new generation of typologies in synchronous dimension. To have better understanding of the complexity associated with this paradigm, 'matrix' has been employed as a technic to illustrates these relationships. In order to compare them with each other, their nonessential properties are classified in three sectors: such as agriculture, industry and services. The transaction between these sectors or the transaction between their outcomes is very significant. It also helps to explain the lateral relationships of the activities organizing the structure of indigenous societies. Figure 4.B.7 illustrates the relationship between agriculture and industry sectors.

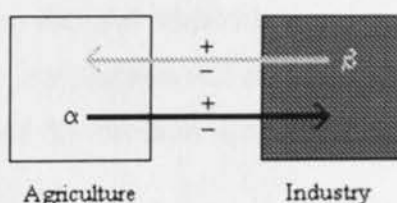


Figure 4.B.7 Negative and positive demands of agriculture ($+\beta$ and $-\beta$) and negative and positive supply of industry ($+\alpha$ and $-\alpha$)

Source: the author

Agriculture makes demand of industry, it may get a positive or a negative response. Likewise, industry may also have negative or positive reply to that demand. Therefore, each sector has four alternatives in relationship with the others. It may demand or supply and may obtain negative or positive responses. Apparently, there will be eight sub-relations between two sectors, i.e. $2 \times 4 = 8$ sets of relations (Figure 4.B.8).

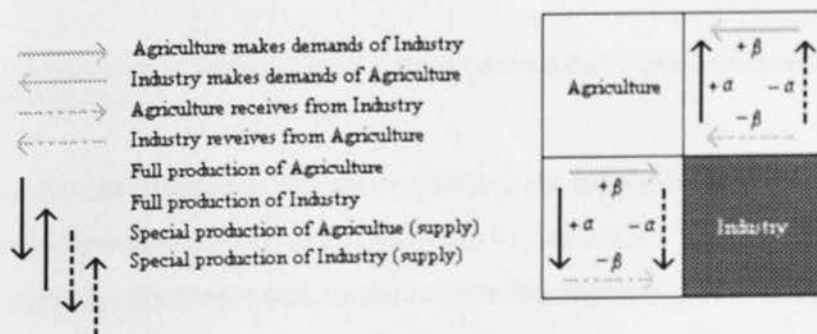


Figure 4.B.8 The eight sub-relations between two sectors in synchronous dimension

Source: the author

As the above grid shows, there is a gradual understanding of getting inside the complexity of the relationships between these sectors. Agriculture, industry and service sectors should satisfy each other in a self-sufficient domain, if not, there is a need for opening out its barriers to communicate with others of different domains using 'export-import' relationship. This means they should export extra products to outside the domain and import the products which are not available inside the domain. Therefore, 'export-import' relationship is a manifestations of supply-demand relationship between two complex systems (societies). Analysing this complexity, a concern has been given to progress the grids technique. Although it may simplify the discussion, but makes it a bit easier to comprehend (see also Different Types of Grid in Section 4.A.7.1.). Therefore, another exploration of grids theory has been suggested by the author which is about diagonal relationships and is different form Geddes's (1927) Complex Thinking Machine. This suggests that diagonal relationship illustrates the essential properties of the activities and the rest show nonessential parts of them (Figure 4.B.9).

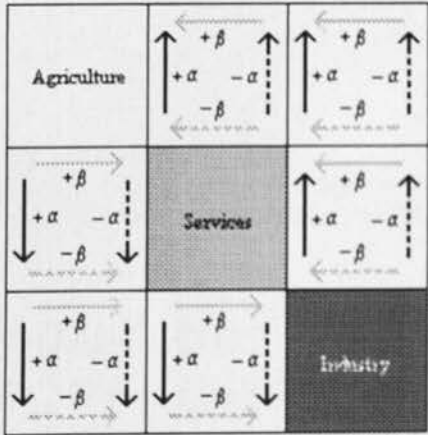


Figure 4.B.9 The importance of the diagonal relationships in showing the essential properties of the activities
Source: the author

The interaction between these three sectors, considering the supply-demand relationship, will also create three-dimensional matrix, as it is shown in Figure 4.B.10. This model works as an open-ended chain of information with causal relationship which is produced by each sector and shows the relation of each sector with the others statistically. Each product can be interpreted to have association, at least, with two processes: one can be its association with

production process which illustrates the way that it has been brought into existence; and the second is with supply-demand paradigm which shows its interaction with the other products in the synchronous dimension. Although, these sectors are seen as metaphor and are not actually separated from each, but each of them has its identity in the matrix. Any attempt for overlapping the similar squares creates an open-ended three-dimensional matrix which illustrates the complexity of the relations in synchronous domain.

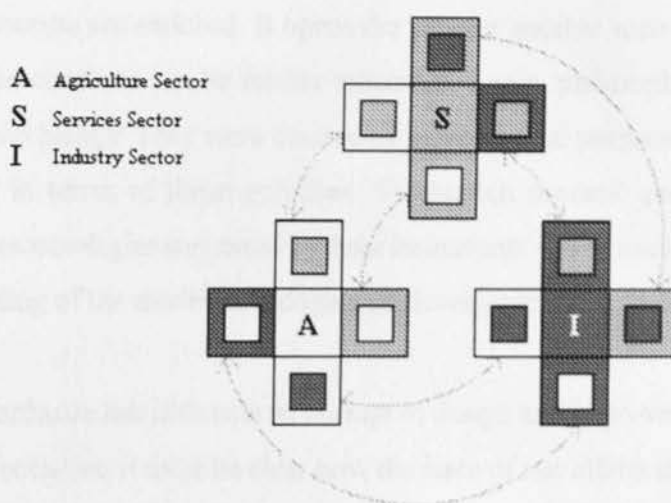


Figure 4.B.10 An open-ended three dimensional grid

The attraction between similar components of different sectors creates this open-ended three dimensional grid whose role in development programmes is similar to the chromosome in alive systems.

Source: the author

There was an attempt to show that functional concepts of behaviour can be used to illuminate the meaning of concepts of formal science which are often taken as indefinable. The author's position throughout has been that the concepts of science form a system and that the wide range of concepts used in science, functional (supply-demand paradigm) as well as structural (production process paradigm), are compatible. Now, it is worthwhile to see the application of the model of endogenous development by exemplification of two models: Marx's General Mode of Production, cited by Barratt Brown (1972); and Endogenous Growth, cited by We's (1994). The former is in Section (r) and the later is in Section (s) of Appendix One. Accordingly, the author would like to suggest that both instances stress on the supply-demand relationship in their proposals to qualify the end-products, therefore pinpoint growth not development. They do not consider users' role as the initiators of process of production.

Conclusion of The Model

All the concepts of science are interdependent and therefore illumination of the meaning of any member of the system of scientific concepts can perform to varying degrees, each of the other concepts in the system. Historical ordering is often confused with logical or epistemological ordering. The thesis does not take the concepts, it began with, to be basic in anyway, but rather it maintains that they are definable in terms of the concepts derived from them. To show that this is the case is not to close a vicious circle but to complete a cycle in which the initial concepts are enriched. It opens the way for another such cycle in which the meanings of all the concepts can be further enhanced. Logic, philosophy and science are instruments of social beings. They were created to serve a social purpose and hence can be better understood in terms of these purposes. 'Production process' and 'supply-demand' paradigms are two terminologies supported by these instruments which assists towards having a better understanding of the model of endogenous development and its functioning.

It is necessary to emphasize that if there is an attempt to design and improve the quality of life and to develop our societies, it must be clear how the state of our affairs differs from that of earlier societies. Because of an increasing rate of technological change, social and environmental crises are generated and come to a head more rapidly today than at any previous time. Therefore, the key point is that development is not a matter of earning but a matter of learning. Learning how to develop requires trying until success. The role of the development programmes should give people an opportunity to learn by practice and to develop themselves from within. Endogenous development, as far as the thesis is concerned, is a rational, psychological, scientific and social concept. It is with respect to people's potential contribution to development for revitalizing their societies and economies which should be evaluated through the natural and cyclic processes of production in a people-centred lateral organization. On the other hand, in an industrial process of production with a good-centred vertical organization the knowledge and the experiences of the production are centralised and concentrated in a few institutions. Organisations of this kind focus the creative impetus into the centres. The inevitable consequence is the generation of typologies of goods and intellectual growth. Here is a case of performance of progress rather than the development.

A goal of endogenous development is to embed nature experience in the pattern of relationships that holds and unfolds among people, places and psychological processes. The fact of a person's movement into a natural place, or of their engagement with a natural feature in a built environment, is assumed to represent the converging influence of evolutionary, sociocultural and motivational forces. Meanings and qualities of nature experience that are salient for individuals or groups are then understood through reference to other forms of environmental experience, individual and collective, past, present and future.

People have lost the knowledge to cope with the environment. It is very important to explore how to retrieve that knowledge which enables our societies to continue living using their own resources. There are some values embedded in people's lives subconsciously and these values come into service whenever there is a pressure against them. The complexity of objects and subjects and their relationship, through process, creates independent productive societies. The model of endogenous development concerns neither people alone nor environments. Rather, it focuses on the transactions between people and environments. It is not primarily concerned with the structure of these transactions, but with the qualities which are simultaneously constructed and revealed through them. People adapt to the environment and create organic and sustainable systems to survive over a long period of time. Any interference without considering the elegance of their organizations may destroy them and transfer them from being productive into consumerist ones. For instance in a productive society, progress of the products is accommodated and caused changes in the subjective part of the system. Therefore, without cultural change there will not be any progress in building the environment, or this is the subject which changes the object in human's intentional process of production.

Therefore, endogeny is directed at society's development, not just its economic growth. It views the reduction of the problems in an endogenous development programme more as a way of improving the quality of life than of increasing the standard of living. It also suggests to redesign society so as to make the problem disappear. The performance of endogenous development is framed in a comprehensive design and plan. It deals with feasibility not when at the time of design but afterwards. The author believes that working backward from where people want to be (idealization) to an attainable state predicting by their design yields a more

advanced state than working forward from where they are. Their design should consist of a system of decisions which has properties that none of its parts do and its parts acquire properties from the design that they would not otherwise have (the whole). Therefore, it is possible to have a feasible design none of whose elements, considered separately, are feasible. Beside feasibility, the author does not deny the flexibility and the process of the design.

This is not to say that wealth is irrelevant to development or the quality of life; it is very relevant. How much people can actually improve their quality of life and that of others depends not only on the people's abilities and desires but also on what resources are available to them. However, it should be kept in mind that resources are more often taken from nature than given by it. The more developed a country or person, the more resources it has to recognize and develop. Put another way, resources are created by what nature provides. What nature provides is not a resource until people have transformed it or learned how to use it.

Achieving this goal, the endogenous development's proposal, regarding its two paradigms: 'production process' and 'supply-demand' relationship, is to have a society based on human values other than buying or selling. To arrive at this society there is a need for a good deal of planning and a good deal of design. In modern societies, professed based on buying and selling (supply-demand relationship) in which all natural and human resources are regarded as the absolute property of the first businessman enterprising enough to exploit them; these secondary aspects of the means of communication tend to encroach further and further of the primary ones (production process). This is aided by the very elaboration and the consequent expense of the means themselves.

Finally, the model of endogenous development set in this thesis has evolved with the expectation that it might be brought into use in a four-stage model of production process which is seen to consist of ultimate cause, subjective cause, objective cause/effect and formal cause/effect. In keeping with the planning and design policy, the ultimate cause, which is the focus of the endogenous development model, is conceptualized at a level which intended to give reality to the people's needs and wants and their applications both as social constructions and as viable environmental constituencies, existent or potential.

PART THREE

VERIFICATION OF CASE STUDIES

INTRODUCTION TO PART THREE

This part consists of two chapters and provides a further evidence for the model, using case studies to test and support it. In Part One, the literature was used to lay out and examine the theories and practices relevant to the discourse, to draw principles and paradigms from what were found. This is a deduction process, increasingly focusing on the intention and direction of the research. In Part Two, seeing the structure and relationship between elements of the data allowed us to conceptualise, reconceptualise and to simulate. This is the process of abduction, the synthesis or resynthesis of the elements discovered in Part One, employing new tools brought from scientific, logical and philosophical world views. Part Three uses an inductive approach in order to support and identify criteria for the criticism of the suggested model. Now, we can see the three major constructs of the thesis: deduction, abduction and induction. Both the deductive and inductive areas of the thesis are relatively objective. The necessity of propounding the topic is the need of more specific expertise on the ground in actual projects. The need has been identified for an over-reaching model.

The aim in this thesis is to make a model useful for professionals in this environment to identify and find appropriate solutions to the problems. In Part Three, case studies have been chosen specifically to test the theory. The case studies chosen are those which illustrate the objectives of endogenous development, and at the same time show the lack of something, which is the more all-embracing concepts. In Part One, a similar process is evident in that there is a lack of a comprehensive model to cover all the issues. The need is for a comprehensive framework which allows for the identification and categorisation of a phenomenon. This is a reformation of the framework which will allow, what was previously an irreconcilable opposite, possible: a potentially all-inclusive conceptual framework.

These case studies, in Chapter Five, have been selected for their notions of people-centred development and organisation, as opposed to economic growth or other form of development. They illustrate participatory approaches. Some are on a national level, while others are local and more specific. They show the difficulties of working with people, and some of the

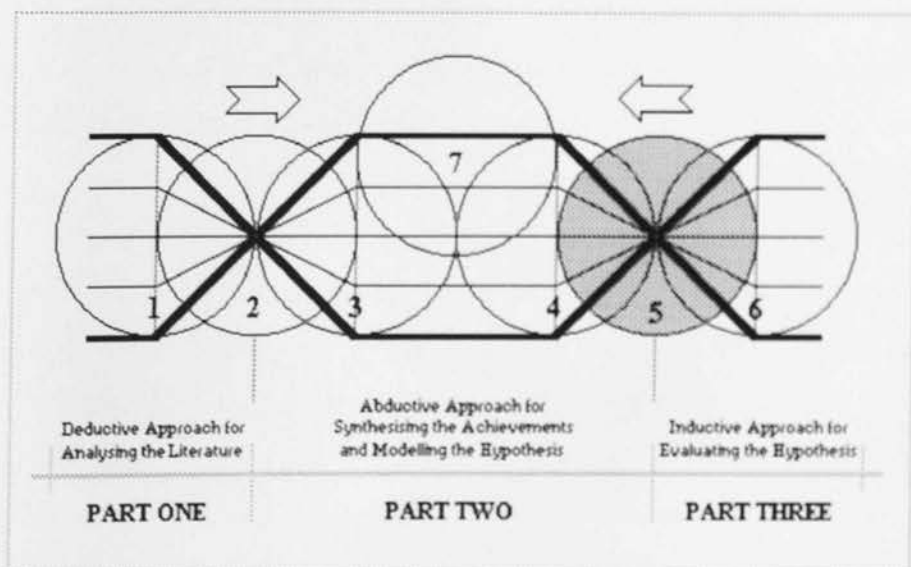
advantages of such action. The people-centred nature of the model means that people take responsibility for their environment, have their own measures for success of the project. It is important that the objectives and aspirations of the people, that is the form of these measurement, can be identified, communicated and built into the process. In this way, the imposition of ideas, concepts and programmes, from the government or other agencies, is less likely and will have less power in the situation.

Chapter Five looks at projects, while Chapter Six is more concerned with people's actual actions. This is the reason that the case studies are not problem oriented, nor direct illustrations of the model in use as it were. The purpose of propounding the case studies is to add to the information for the models. They also assist the model to show some of its future implications. It is hoped that the case studies will help readers realise the feasibility and practicality of the model. The model is, therefore, supported by physical examples of some aspects of the model in action. It should give hope that the model is not purely conceptual, but is realistic, and is in a state of continual growth and development itself.

Chapter Six is the Questionnaire which aimed to go deeper into the respondents' aspirations and perceptions, using an open-ended format. The people were asked about changes and development, and their role in this area. The aim is to find what people see as important, but more specifically who they refer to and defer to, over notions of responsibility and empowerment.

CHAPTER FIVE

SUPPORTING PRACTICAL SCHEMES



5

SUPPORTING PRACTICAL SCHEMES

Introduction to Supporting Practical Schemes

5.1. **Iran's Geographical and Historical Background**

5.2. **Selseleh Regional Development Plan: Aleshtar**

5.2.1. Lessons from the Discussions in the Workshop

5.2.2. Selseleh Project in Iran.

5.3. **Endogenous Development and the Author's Experiences**

5.4. **Development Plan for Mobarakeh Steel Complex in Isfahan**

5.5. **Reconstruction after Disasters and People's Participation in Iran**

5.5.1. Reconstruction of War-Damaged Areas in Iran-Iraq War

5.5.2. Reconstruction of Damaged Areas following the Earthquake in Gillan

Summary and Further Discussion of Supporting Practical Schemes

Introduction to Supporting Practical Schemes

This chapter aims to test the model of endogenous development in two ways: first, to show some implications of the idea as set in motion in Iran, and some reasons why such a model is necessary. Secondly, it shows that in four different case studies, which are supported by the Government in one way or another, there is a notion of criticism of existing problems and strategies in development programmes and a need for concepts, models and new paradigms which can evaluate the work or design or redesign long term development programmes. In this regard, hypothetic (abductive) inference, which merely suggests that something 'may be' and looks for discovery of 'causes', has been employed in this chapter.

There is a series of objectives necessary to develop the Country. Because Iran has a revolutionary regime, the aim of the Government is to consider the needs and aspirations of the people, the Country's political and economic independency, economic growth and many other needs. A most crucial matter is the need to consider people in the development of these objectives. Experience shows that often the potential of the people's participation is not achieved and it is accepted that greater and effective participation will lead to the avoidance of new problems and a more sustainable outcome for the programmes. There has, therefore, been a need identified in some case studies which is the development of a new paradigm. The case studies chosen for this chapter are about:

1. Selseleh Regional Development Plan; (which seems to be a 'utopian' movement in built environment disciplines whose proposals were published in a proceeding in 1976, before the establishment of the Islamic Revolution of Iran.)
2. the author's experiences; (the principles of endogenous development were unconsciously applied and developed within university teaching and simultaneously working in the Ministry of Culture from 1978 until 1993 by the author. There are several approaches which can be used as case studies in this respect.)
3. Development Plan for Mobarakeh Steel Complex in Isfahan; (which is a regional planning project using experts from universities rather than consultancies in the

development of an iron and steel town complex. The objective here was to look at meeting the real needs of the region. This was considered as a revolutionary objective. The choice of university staff over consultants was made as an attempt to locate the work closer to the people's needs and to consider the region's needs in terms of reducing the impact of pollution, unemployment, economic and social changes, etc., with the idea that the universities would be more sympathetic to these aims.) and

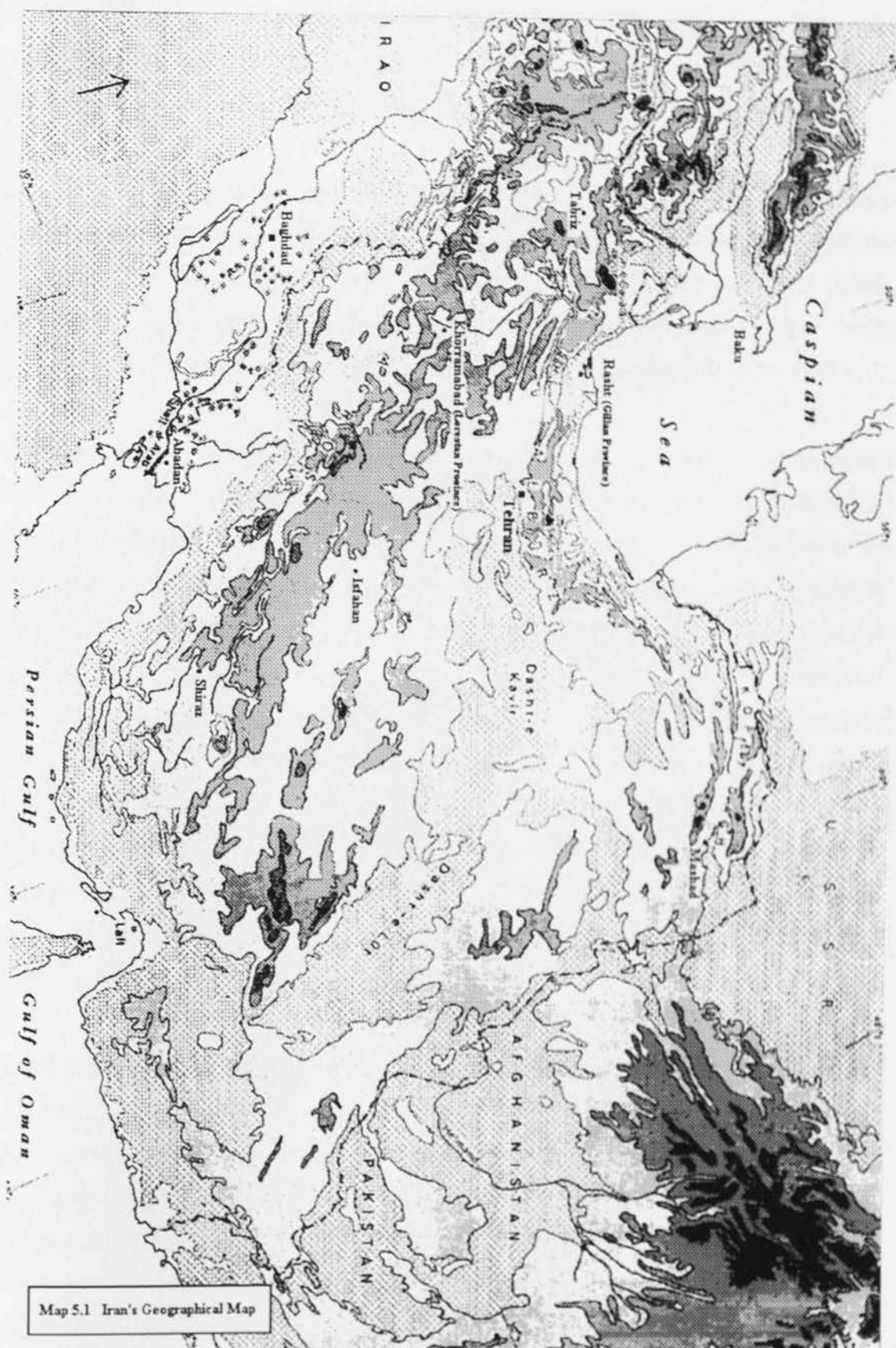
4. reconstruction after disasters. [There were two great needs in Iran after the Revolution (1978) about the built environment. The first was for the reconstruction of War-Torn towns, villages and cities; the second was because of the impact of a series of natural disasters.]

Before starting the case studies, it is important to have a brief review of the Country's background to be able to have a better understanding of scale of the problems and their solutions. This will also be helpful in evaluating the principles proposed by the cases, which all aimed to bridge the gape between the Government and the people, and to find the reasons behind their failures and successes.

5.1. Iran's Geographical and Historical Background

The geography of a country molds its history and society, and in Iran the influence of the geographical factors has been strong. Iran¹ is the largest and most populous country in Southwest Asia (Map 5.1). The nation possesses abundant petroleum resources and is also important because of its rapidly developing economy and strategic location. The Country was known as Persia, from the ancient Greek name Persia, but in 1935 the Iranian Government

¹ In a research made by Common Census of Population and Inhabitant in 1996, Iran is divided into 26 provinces, 252 small provinces or townships, 68 districts, 614 cities, 2213 rural districts and 68125 villages. The population of Iran in October 1996 was 60,055,488 that 61.30 per cent of them live in urban areas, 38.34 per cent live in rural areas and the rest are not habitats. From the total population more than 50 per cent, i.e. 30,515,159, are males. Near 39.50 per cent of the Country's population are less than 15 years old, 56.12 per cent are between 15-64 years old, and 4.38 per cent are between 65 years old and above. About 99.56 per cent of all Iranians are Muslims; 93 per cent are Shi'ite. Iran is the world's centre of Shi'ite Islam, and it is the official state religion. Most of the ethnic minorities, however, including Kurds, Baluchi, Turks, and Arabs, are Sunnites. Shi'ism is based on the doctrine of Imamate.



Map 5.1 Iran's Geographical Map

requested use of the older and correct name, 'Iran', meaning: Land of the Aryans. Iran was a monarchy for more than 2,500 years until 1979. In that year the Shah of Iran, Mohammed Reza Pahlavi, was deposed and the Islamic Republic was declared (Turner, 1991).

Iran is tremendously rich in minerals especially petroleum and natural gas. In 1986, she was the sixth-largest producer of oil in the world with an average output of 700 million barrels per year. Petroleum production declined substantially beginning in 1979, i.e. after Islamic Revolution of Iran. Much of the natural gas is exported by pipeline to the Russia. In the 1970s iron and coal deposits were developed for use in the new steel industry (Turner, 1991).

During the 1960s and 1970s the Shah attempted to transform Iran into a modern and industrial nation. In 1963 the Shah initiated an ambitious programme of modernization (including land reform, emancipation of women and rapid industrialization) known as the White Revolution which was accompanied by corruption and widespread social dislocation. As revenues increased following the world rise in oil prices in the 1970s, Iran could have an increase in her economic growth rate. This rapid growth created a prosperous middle class, but it also caused widespread social and cultural problems. After the 1979 Revolution, Iran's Revolutionary Government emphasized on self-sufficiency and Islamic scholars had greater power over economic decisions than did government officials until late 1987. Most industries (including the oil industry in 1981) were nationalized and many large-scale projects were abandoned. Oil exports have remained at a relatively high level despite the damage to wells, refineries and export terminals caused by the long Iran-Iraq War (1980-88) which consumed about 30 per cent of the GNP and adversely affected the economy (Ibid.).

The economic policy of contemporary Iran has been shaped under the complex influence of a number of internal and external factors. Naturally, the changes which have taken place in the aftermath of the Islamic Revolution have not only affected politics and society but also the Country's economy. Within Iran's Post-Revolutionary economic development, one can distinguish two important phases: between 1979 and 1988 which started by the Revolutionary Government's control of all the Country's enterprises and continued by redirecting the resources in order to make up for the damage inflicted by the Imposed War and meeting the

basic need of the population; and The Post-War Period whose characteristic was market-oriented providing for a number of measures to encourage the development of free enterprise (Salam Iran, 1998)².

The economy inherited from the Shah was characterised by poor agriculture, high foreign dependency for food supplies, a mortgaged industrial sectors and concentration of income in an elite group, particularly the royal family. Even without the War, redirecting such an economy towards self-sufficiency would have been a major task for years. However, there can be no doubt that the War formed a major break in Iran's Post-Revolutionary development. There were a number of additional factors which posed a severe burden to reconstructing the Country's economy. With Iran's industrial output being reduced to 40 per cent of her potential capacity, she had to meet the needs of a population whose number had doubled within only one decade. Furthermore, the Country had to cope with a total of 3.5 million refugees who had fled to Iran from Afghanistan. During the War, almost 5 million lost their employment, 2.5 million people migrated from their home lands and half a million Iraqi refugees also added to the problems. All the while, the budget deficit amounted to more than 52 per cent and the national inflation exceeded 20 per cent (Salam Iran, 1998; and Zargar, 1989a).

After this brief introductory to the survey's situation which pinpoints the widespread social and cultural dislocation in the Shah's regime and the need for self-sufficient and independent society promised by Islamic Revolution, the author would like to trace the roots of a new idea emerging in the built environment professions in the case studies. This indistinct concept encouraged the government officials to be concerned about the principles needed for coping with some of the Country's problems in order to resolve them or to be aware of the new schemes in development programmes based on the people's potential and local resources.

5.2. Selseleh Regional Development Plan: Aleshtar

A number of architects from several countries established a workshop. In the report of this workshop (1979) named 'Traditional Building and the Third World', there were some indications which referred to the aims of its initiators. They were active in research projects

² <http://www.SalamIran.org/IranInfor/Economy/Overview>

into the development of traditional buildings appropriate to the Third World based in Iran, Egypt, Sudan, Oman, India, Turkey and others. The main objective of the workshop was to teach and train young builders and students from villages. There were also some university students involved. Educational material such as journals and publications, exhibitions and films were produced. Another objective was to establish small scale industry and to develop local building materials.

The proceeding of the workshop acknowledges Dr Majid Rahnama who was responsible for the development process in regional planning of Selseleh which was conducted in the region of Lurestan in Iran; Hassan Fathy who was working in Egypt; the London Architect Association; Intermediate Technology Development; and journals such as *Architecture Design* and the *Ecologist* and *Ekistics* which cooperated with this workshop. It also acknowledges three people from Iran: Teacher Aladdin Hojaj-e Ahl-e Nopia; Master Hussain Yazdi; and Mason Adel from Aleshtar. Catalogue, which explained the activities of the workshop for an exhibition in Tehran, published by the Centre of Endogenous Development and Studies, Selseleh Regional Development Plan, 1976.

This workshop grew from an intellectual movement which promoted sympathy for the predicaments of the Third World similar to the objectives of AT³: Appropriate Technology which is said to be influenced by another key book of the early 1970s: Schumacher's 'Small is Beautiful'. In Iran, this movement was supported by the Shah's regime considering the social problems which were the consequence of hasty economic growth of the 1970s in the Country, but there was less emphasis on a serious revolutionary paradigm behind the work and took a very direct approach to the situation. This mixture of intellectual idealism and pragmatism was fatally flawed. Despite their good intentions and resourcefulness, they succeeded most in magnifying the importance of architecture in isolation from other aspects of life and ended up imposing new designs rather than developing the existing ones, thereby concentrating on improving the effects rather than the causes of the problems and difficulties of Third World and Iranian people.

³ See Section 2.B.2.1. about Third World Problems and Priorities in Chapter Two for AT's objectives.

The participants suggested some definitions of tradition. Saying that 'these traditions have many lessons for us', they opened out the opportunity for participation and direct control by people based on the idea that they should consume less local material and energy and adapt to the environment. To explain the above notion, they considered housing as an example and referred to an Arabic expression which says 'when you stop improving your house your death will come upon you.' Here, their suggestion, similar to this thesis's proposal, is that a house should always be in the process of development. The researchers found many examples in the Third World where people began with one room and because of the expansion of the family and for other reasons they would add to that room sometimes creating even a three-storey building. In these countries, the governments produced and distributed the houses because there was an assumption that the other agencies were not accurate, therefore reliable.

This workshop, which covered a wide range of activities in different fields from architecture to urban planning, was also attempting to review the criteria for evaluating traditional styles. It had two reasons for this: first, while some Third World Countries are following Western lifestyles their daily life is still based on tradition; understanding and developing the possibilities of traditional ways to satisfy the needs of people will make every attempt, to improve and develop, acceptable. Secondly, most Third World Countries are in a situation where, because of high demand, resources are running out. It argues that this is an international problem and governments are much concerned with the limits of the resources and increasing import costs. The same source suggests that traditional styles are the result of centuries of experience in using local materials considering saving money energy and resources first and foremost. Therefore, understanding of these resources will lead to self-sufficiency in the Third World. Nowadays, this is perhaps realistic management policy.

They also argue that mostly in Third World Countries designers neglect the traditional types of buildings and instead they choose Western styles which are not suitable for local and ecological situations. They asserted that the aesthetic, surface appearance of Western building materials, allied to associations with luxury and wealth made these materials more popular than traditional ones. It seems that there is a strong argument that most Developing and Less-developed Countries have bought the conception that they should follow First World practices

rather than use those of the Third World. They also pinpointed the fact that Third World has developed traditional styles of building, especially in villages and old towns, over thousands of years into types which can adapt with needs and local conditions. These types are the manifestations of people's talents, even in coping with harsh situations and hazards.

5.2.1. Lessons from the Discussions in the Workshop

One of the points discussed in the workshop was about Salaleh's experience. In Salaleh which is in the South of Oman, one of the residents, whose family had lived for generations in the same house, described the ways the house changed over the years. Initially the house was a single room, but as the family grew and became wealthier, more rooms were added until it was, at that time, three storeys high with more rooms being added on top as more people arrived. This was a common practice for people in the area. Thus, the architecture was seen as being essentially flexible and open for people to participate in the design of their living environment. The same source refers to this point and claims that traditional styles can correspond to the needs and local resources and are under the control of the people, but the Government buildings, or buildings for other agencies, are built according to other rules.

The workshop also found that the bad state of some traditional buildings were the result of high density living, poverty and neglect, rather than something inherent in traditional styles. It did not preclude the possibility of using the experience and traditions of people outside their immediate community in informing their architectural styles where the situation or conditions are similar. This point is also regarded by this thesis as one of the characteristics of the model of endogenous development which can be fitted in supply-demand relationship.

They claimed that the traditional building industry is concerned with skills and resources which create opportunities for employment, a maximum impact on the distribution of capital, an increased standard of living and a development and expansion of those skills and resources. Accordingly, there is no doubt that big projects for common or public use should be divided into smaller activities to allow for the contributions of unskilled local workers. They also concluded that traditional buildings support small scale industries which have their own artistic and craft values. Investing in traditional buildings, therefore helps to encourage the realisation

of the potential of workers and their masters, and helps in keeping control over industry and production processes.

In relation to the regional and urban planning, they argue that the concentration of capital in a few cities in Third World Countries, which already accommodate most of the world's population, brings about the immigration of large numbers of villagers to these cities. Because this vast increase in labour cannot be absorbed, the villagers turn to work in nonproductive service sectors. They suggest that to attract them back to rural areas there is a need for a policy of decentralisation and putting more attention onto smaller industries. The way to solve the crises in city life, they claim, depends on a policy of rural development.

5.2.2. Selseleh Project in Iran.

Selseleh is the name of a vast plane in Lurestan region which is surrounded by the Zagros Mountain range. Its people are mostly nomadic. The aim of this project was to create a comprehensive plan with the intention of educating the people in using their own resources for their development and in satisfying their needs. Therefore, 90 local people were selected to be educated in agriculture, literacy and health, so that they could return to their villages and help others in developing their region. This project also looked to encourage villagers by offering financial and professional help in creating small industries such as brick making, road building, providing for water supply, public baths, and so on.

The project had different approaches in qualifying the built environment in the region which manifested itself in the villages via small projects such as stones for paths, better cover for mud walls, fixing windows into the top of walls for ventilation and light, the separation of pathways for animals and humans, healthier kitchens and WCs. Simultaneously, the handy crafts approach was pursued not only in Iran, but also in other countries, such as Nepal, Oman and Egypt by the same group involved in the same workshop.

Ideas were also expressed concerning urban planning. For instance in Aleshtar which was the centre for the administrative and economical activities of the Selseleh region, they promoted suggestions for dealing with people in ghettos and shanty towns in the provision of cheap

flexible basic housing: including the provision of long-term loans, land, professional aid, basic need requirements and building materials. The same group claimed that the government (of Shah's regime) was not capable of understanding the real needs of people and that the housing it provided only created more problems.

Another issue was about public buildings in Iran such as the public baths. The intention was to look at the social health of people and this project focused around the public bath. The notion was that if people share in the creation of a building and if it meets a perceived need people will use it and look after it. This would meet individual and societal needs.

Adaptable design is another aspect of the work of this group. This is taking a technological approach to architecture and living practices, promoting traditional methods of heating and cooling systems for example. The project examined a variety of wind catchers, cooling systems, water storage, doors, windows, walls, the construction of domes, the use of clay and other materials and the traditional skills involved in these practices. They also practised a kind of bio-architecture. For instance, it was suggested that the palm tree has a variety of uses, for shade, food, protection, etc. Methods of protecting the plant were discussed and the process moved the emphasis back onto the ecological importance of the palm within a technologically advanced society. They concentrated here on Egypt, Oman and Pakistan.

The pioneers of this movement, for the most part, were architects who were reformist rather than revolutionary looking to cover the problem up or remove the surface indications of the problem, rather than a fundamental criticism or change to the deeper issues. These might include the existing centralisation and industrialisation policies. They also were unable or unwilling to generalise the problem and could not address philosophical, ideological or scientific explanations of their work, therefore it was doomed to fail, unsatisfactory in many cases and unable to expand as a movement. The decentralised and nongovernmental nature of the movement might be partly to blame, as might be the way in which they were more concerned with seeing architecture as an end in itself, rather than a complexity of society.

The author would like to reiterate that small scale intermediate technology, environmentalism,

sustainability, etc., are not enough to explain the complexity of our life and to resolve our problems. There is a need for a new paradigm, a universal and comprehensive concept or model (as we examined in the previous chapter) which can be easily understood and interpreted into the built environment. However, this movement is known as the initiator of endogenous development practice in Iran whose attempt was to project the value of using people's participation in the built environment disciplines. Their emphasis was on the instrumental principles of design, which can be defined by the model of endogenous development as abductive reasoning, using people's participation in creation. They did not reach the broader domain that of evolution of the values by emphasizing on the symbolic principles of life process using participatory approach by accomplishment of induction.

5.3. Endogenous Development and the Author's Experiences

In a symposium of the Foundation for Integrated Education, Professor Mather (1951) discussed 'Integrative Studies for General Education'. One of the criticisms of general education, he says, is based upon the fact that it may easily degenerate into the mere presentation of information picked up in as many fields of inquiry as there is time to survey during a semester or a year. He refers to the fact⁴ that more important is the search for basic concepts and underlying principles that may be valid throughout the body of knowledge. Similar to this objective, the author has run many workshops with students from different levels and different courses in architecture, usually as round table discussions and usually held in a specific region, so that the debate was based on real situation. It was considered important that the studio workshop would allow for the cross-fertilisation of ideas between themselves at their different levels and from the specific environment. The development of the student potential and the information they already held was the main aim of the workshops, rather than the teaching of more material and information. The workshops aimed to integrate the work of universities with work in the real situations outside the academic environment. The students were encouraged therefore to face, document and address the problem directly.

An interdisciplinary approach was also attempted in architecture department where

⁴ This is also the author's concern in his educational experiences in Dr Shahid Beheshti and Tehran Universities from 1976.

researchers, staff and students would work together across boundaries. Two centres for documentation were founded by the author: first in the Architecture Department, Dr Shahid Beheshti University, 1979, which holds maps, monographs, drawings, photographs, models, etc., and was properly documented and managed; and second in the Architecture Department, Faculty of Fine Arts, Tehran University, 1985. This provided material for exhibitions and learning situations. Research and important works of tutors and students were, therefore, the basis for a new mechanism for the distribution of the information. The previous centralised and one-way approach in education was therefore opened out into a multidisciplinary, person-based information and creation system. That was intended to be an alive system, encouraging feedback from users and contributors, so that the participants had access to improve and interfere with the system itself. 'Namaieh Sazi' [a Farsi word for classifying information by using Punched Card System method which is different from Universal Decimal Classification (U.D.C.) and Congress classification methods and appropriate for small libraries] was set up to classify the documents. This technique allows one to control and progress information.

There are many examples that can be drawn from the author's management experiences. One aspect was the development of a visual arts centre. This centre had three museums and many offices for the fine and visual arts. It had responsibility for the visual arts in national scale. The Government was responsible for the development, support and teaching of the arts which moved from a central and patronistic attitude to the artists and experts into a more 'abductive participatory' approach, bringing consultants and professionals in their fields into committees and action groups which were self-regulatory.

A supreme committee was made up of master representatives of areas of Iranian art - sculpture, calligraphy, miniatures, painting, university departments and a representative of government. A second committee was made of experts who were specialised in their fields, but Government employees at the same time. A third committee was the management committee made up of the author as chief manager, museum coordinators and other managers related to the art institutions. The fourth was a personnel committee. Problems and objectives were discussed. This structure aimed to decentralise the role of the office and to help it to do its duty and service the arts community outside the strict realm of the Government. This

seemingly simple structure and idea was at the time a new development. The emphasis was shifted from a centralised, bureaucratic, government controlled and government directed art to a social form of art from the heart of the people. Despite lack of finances, the will and interest from the galleries, artists, masters and certain government officials helped to achieve a great increase in the quality and number of art pieces and exhibition spaces.

In sculpture and Iranian painting (miniature), masters were invited to join with other artists for regular sessions in premises provided for the purpose. They discussed their work and ideas, produced manifestos and redesigned their work into collaborative projects. There was a development of 'public art' which moved from being controlled by government and councillors to public involvement in open competitions for the public art judged and selected by an elected committee before presentation to the local government. The committee also organised large and important museum standard exhibitions. It was evident from the activities themselves that a momentum was developed which in itself encouraged an atmosphere of creativity and appreciation for these arts.

The emphasis was to localise the arts to promote the level of the arts in local regions, but also to promote the fine and higher arts at the level of masters. The impetus, although originally set up within the Government, was evidently coming from the people and their role in relation to the different committees. The society was the place where the work was developed and grew. These committees and practices were further developed and set into law. At the same time, a consultancy system developed whereby the arts were elevated again away from simple crafts to a part of the national heritage with governmental support.

These are examples, therefore, of very basic and real development and changes which encouraged the active and successful participation of the people and ensured the survival of these branches of art within everyday society and in the universities and Government. They served as very strong reminder of the potentials of everyday people and the possibilities of an alive system. The power of being activated and motivated in order to make and produce, to find a means of self-expression and to work and be involved in the creation and beautification of the environment, was very strong. It is important to see that the process was one of the

dialogue, joint collaboration, feedback and reflection of actions and that this is what the artists acknowledged that it was successful, rather than the imposition of ideas or the requirement that people work for an external cause which tends to deaden the process.

5.4. Development Plan for Mobarakeh Steel Complex in Isfahan

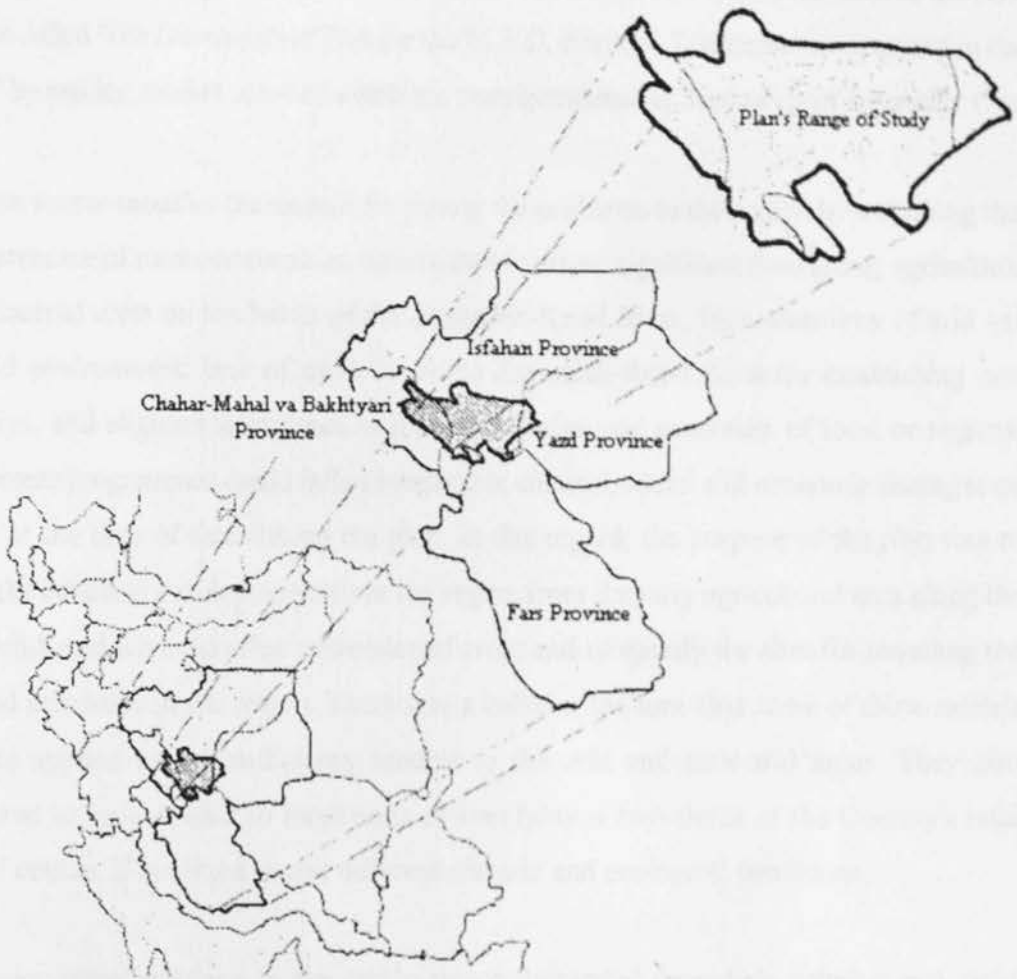
After the victory of the Islamic Revolution, new opportunities were provided to prepare development plans and programmes for different regions of the Country. This necessitated a reconsideration of definitions, views, goals and methods regarding environmental problems, to find proper solutions based on cultural and social values and economic needs. With respect to the establishment of industries - especially iron and steel, mainly located in Isfahan Province (Map 5.2) in the agricultural zone of the Zayandeh-Rood River - a reconsideration demanded preparing a comprehensive plan to set up chain industries for production of iron and its conversion into steel (Ministry of Mines and Metals's Report⁵, 1991). In this regard, Erfanian (1991), the executive manager of Mobarakeh Steel Complex, points the main objective as the following: "Industry ... occupies an outstanding position in Islamic outlook The wide gulf between the Islamic point of view and the present day outlook concerning knowledge is implied in the point that the Quran deems Man as the pivot and knowledge as the instrument of his mind and industry as the instrument of his action, whereas in the present day world economy is regarded as the pivot and Man, knowledge, industry and even culture as the means of reaching its zenith."

To obtain planning models, the factors which affected the establishment of industry and the effects of industry on environment were the essential matters needed to be identified and studied for two purposes. These goals were defined by the consultancies as follows:

- a) designing models to achieve balance and to form links between industry and environment as a basis for the preparation and presentation of development models for the region; and
- b) designing models from which to prepare comprehensive plans for integrated steel

⁵ Ministry of Mines and Metals's Report, 1991, *Development Plan for Mobarakeh Steel Complex Region*, Sahab Geographic & Drafting Institute, Summer 1991, Tehran.

production from extraction of iron through production of crude steel to preparation of finished products for the market.



Map 5.2 Plan's Range of Study

Source: Ministry of Mines and Metals's Report (1991)

For establishing a new industry along the developed axis of Zayandeh-Rood and the undeveloped region in its south, the report indicated that it became necessary to have interdisciplinary approach, therefore, centralize research, planning, design and execution in the region to clarify the goals of group (a) models. It also indicates that for developing the proper models required the cooperation of research, planning, design and execution bodies with the universities (the Dr Shahid Beheshti and Isfahan Universities), consulting groups and government organizations. Constant collaboration of the university representatives, from various fields of scientific expertise with the Urban Planning and Architecture Department of

the Mobarakeh Steel Complex Region (M.S.C.) and the provincial government organizations during the years 1983-86 resulted in development of group (a), i.e. models for establishing the industry and coordinating it with the environment. These models were presented in the form of a plan called 'The Development Plan for the M.S.C. Region'. The author cooperated in this project⁶ by making models some of which has been introduced in Section (I) of Appendix One.

The same source modifies the reasons for posing the problems in the region by indicating that due to presence of rural communities; formation of various significant flourishing agricultural and industrial units on the banks of the Zayandeh-Rood River; high sensitivity of arid and semiarid environment; lack of capacity in the Zayandeh-Rood Zone for establishing new industries; and slightest negligence in planning, design and execution of local or regional development programmes could inflict irreparable cultural, social and economic damages on M.S.C. at the time of establishing the plan. In this regard, the purpose of the plan was to change the industrial development axis in the region from the busy agricultural area along the Zayandeh-Rood River to other undeveloped areas and to specify the sites for installing the affiliated industries in the region. There was a belief at the time that some of those models could be applied as self-sufficiency models to the arid and semi-arid areas. They also considered to be extended to most parts of Iran (almost two-thirds of the Country's total area), of course, if modified to suit different climatic and ecological conditions.

There were some problems in the region which demanded immediate solution and rapid application of the models to overcome the crises resulting from the improper policies implemented and the unwise steps taken before the Islamic Revolution of Iran in the Shah's regime. Among them, partial decrease in the population of the rural areas in the undeveloped regions of the plan; beginning of migration to the region during the first stages of the M.S.C. construction; allocation of agricultural lands for industrial activities, urban development and civil services; beginning of the construction of the M.S.C. affiliated industries in the region; destruction of natural resources (vegetation and soil) in the region; detachment of the industry from other regional concerns; reduction in the efficiency of the regional potentialities due to

⁶ This plan was guided by Ghandehari, the project manager in Shahid Beheshti University whose ideas were revolutionary in regional planning and encouraged the author to do research about some of them.

lack of coordination among the organizations in charge of execution, training and services, and improper utilization of national wealth for the establishment of the M.S.C. in Isfahan, inflicting damages on the economy of the region are referred to by the same report.

The first joint effort of the universities and the M.S.C. was directed towards identifying the goals of the Development Plan for the M.S.C. Region according to the definition of the existing problems. This also is referred to by the same source which is summarized and consists of: attraction of the region's agricultural workforce by the industry and reduction in agricultural activities because of the expansion of industry in the region; installation and assimilation of new industries along the Zayandeh-Rood axis, increasing the bad effects associated with the concentration of industries and population on the regional agriculture; destruction of the environment because of the establishment of affiliated industries and the expansion of residential units without considering the cultural and economic fabric and potentialities of the region; evacuation of the undeveloped rural areas from the only true patrons of the environment and their settlement around the new industrialized region; growth of the migration trend from other parts of the Country and the unpredicted settlement of the migrants in the region. In view of these problems, the goals of the Development Plan for the M.S.C. Region included the following:

- a) minimizing the damages caused by the existing industries on the agricultural zone;
- b) reducing the pressures on the flourishing and busy agricultural zone of Zayandeh-Rood and the region caused by the establishment of the M.S.C., its affiliated industries and the required residential units; and
- c) clarifying the development planning models for arid and semiarid areas and extending the models obtained to similar areas.

To reach the above goals, the study of the region, with an area of about two million hectares, was seen as a necessary factor for the model. Therefore, nine categories of solution were proposed to the problems associated with the work through which some can be considered as if they are directed towards the model of endogenous development. Among them, cultural growth, utilizing potential resources, interrelationship among the managers, considering the

rural communities' needs, establishing interrelationships between people and government, creating effective ties and harmony between actual and potential forces, cooperation of the people of different zones, setting studying centres and employing the universities (teaching staff and students) to enhance education, research and propagation are worth mentioning. This plan had manifold and dynamic aspects. The report indicates that the efforts to achieve these goals had been partially successful in some areas and more successful in the others.

5.5. Reconstruction after Disasters and People's Participation in Iran

The forth and the last case study is about reconstruction after disasters. In this section, the author will try to establish the nature of the crisis which has afflicted more conventional methods of reconstruction and development. The section will give evidence for the existence of such a crisis, review the criticisms which have been advanced against the centralised and governmental approach towards reconstruction and development and indicate the general nature of the alternative approach which these criticisms imply. The function of this section is, therefore, to set the scene for the particular methods of using people's participation which is described in Chapter Two and Four. The principal objective of this section is to demonstrate the validity of people's participation and the need for greater integration of society in the process of physical planning and design.

The present planning and administration system of Iran is originated in and largely remains the Pre-Revolutionary system. The Sepah-e Pasdaran (Guardian Corps) parallel to the army, Jihad-e Sazandegi (Construction Crusade) parallel to the Ministry of Agriculture and Bonyad-e Maskan (Housing Foundation) parallel to Ministry of Housing and Urban Planning, the new national developmental oriented organizations, were formed after the Islamic Revolution of Iran. For the time being, all attempts are being made to coordinate the activities of these dual organizations. Some suggestions have been made to integrate them. But, some prefer to keep them separate and decentralized. To be able to explain this claim, the author would like to refer to a villager's statement which illustrates a dramatic change in the behaviour of the Revolutionary Organizations: "In the beginning of the Revolution the jihadgaran (those who work in the Jihad-e Sazandegi) used to come to us; now we have to go to their offices." However, there are also other organizations which had been set up after the Revolution for

considering Islamic social and economic justice to ensure social security such as Bonyad-e Shahid (serving the Martyrs' families), Bonyad-e Janbazan (supporting those wounded in the War), Bonyad-e Mostazaffan (sponsoring the young, old and poor people) and the like. Although mutual organizations have been creating some problems, but it should be kept in mind that the nature of the revolutionary organizations used to be lateral and some of them are financing by the people directly or indirectly and are functioning laterally.

The Government's programme for reconstruction was published in *Keyhan-e Havaei* (17 May 1989). It included some general policies, directing towards considering people's participation and local resources, by pinpointing the principle of participation of people of each region and popular forces in reconstruction according to the regulations, clarifying the method and areas of cooperation; the necessity of following the observation of cultural characteristics, customs and the psychological situation of the people in each area and in every activity; building the minimum accommodation for use and considering the possibility of physical development for future; and the necessity of studying and paying attention to the possibility of combining rural complexes and farm lands, the repairs of irrigation canals and water sources and housing lands, observing the right of their owners to the supply of services and exploitation of water and land and reducing national expenditure.

Later, the policies, priorities, functions and experiences of nine years of reconstruction in the Islamic Republic of Iran until January 1991 were referred to in a paper submitted to the Second International Conference on Reconstruction of the War-Damaged areas by Mirzadeh⁷. The policies for construction administration and popular participation, which illustrate thoroughly the importance of people's participation, lateral organization via more communication and the cultural context, are suggested by the paper as followings:

- a. the owners are responsible for the construction of their own units;
- b. designing and building of dwellings are up to the owners;
- c. the Government will participate in the execution of programmes and affairs which

⁷ Mirzadeh was the vice president in administrative affairs and special representative of the Government in reconstruction and renovation of War-Damaged areas in 1991.

- cannot be handled by the owners;
- d. guidance of and supervision over the executive programmes;
- e. strengthening the executive organs in respect of their equipment, facilities and specialized Manpower and their location in the War-Damaged areas;
- f. supervision over and provision of technical services;
- g. general provisions and the supply of principal items (provision of materials at the site for the units under construction) are undertaken by the Government;
- h. using the services of the auxiliary provinces in the form of working groups under the supervision of the reconstruction programme executive; and
- i. strengthening the local executive organs with respect to equipment, facilities and specialized Manpower.

In reconstruction of War-Damaged areas, local projects, the residential areas and local work were not successful in satisfying the needs of the people in considering their cultural and historical needs. For instance, Zargar (1989a) points to the fact that some problems which arose were not avoidable due as they were to lack of money, the needs of the War etc. He suggests that others, in particular the ecology, the moving of a city by several miles, the consideration of culture and climate etc., might have been avoided if the information and knowledge of the people had been better used. The unclear development policy; uncertainty about security with a position of no war no peace; and the long term hostility of the Super Powers and the revolutionary goals of independence; were also his major considerations. Therefore, the ruined economy, limited income and unlimited expenditure needs and the lack of efficiency of the centralised technocratic planning system to cope with the reconstruction problems all together eliminated any developmental oriented strategy.

In reconstruction following the earthquake in the north of Iran (1990), evidence suggests that the Government changed its strategy and looked to consider the potentials of the local people and resources. It seems that interference from outside, from specialists and government was reduced and management of the project was given to local authorities. The costs were simultaneously vastly reduced and people themselves were more satisfied with the outcome and results of the reconstruction. The distributions of wealth and resources were considered

with an eye for the long term (Akhoundi, 1992). The situation, of course, was very different from the War and the limitations caused by the disaster also different, especially the level of destruction over time. However, the approach to the real needs of the people and the development process showed that there was a better relationship between the Government and the people. This claim and the differences between the two strategies in reconstruction are discussed in the following discussions in more details.

5.5.1. Reconstruction of War-Damaged Areas in Iran-Iraq War

War between Iran and Iraq started in 22 September 1980 and lasted eight years before the cease-fire in July 1988. A large area of the west and southwest of Iran was invaded by Iraqi army in this War. The War caused many problems for Iran about loss of human life and severe destruction of the economy and the built environment, particularly in the most exposed area of approximately one-tenth of the national territory, more than 80 cities and towns there having been invaded and partially destroyed. Between September 1980 and May 1983 a further 61 cities and towns had bombed or rocketed and in these 174,459 residential, commercial and cultural buildings were destroyed. The total number of residential units destroyed in 4,873 villages in the five provinces was 202,356 units (Chamran, 1986). During the war, some 900 factories were damaged and many others were closed, as there was not enough currency to buy the raw materials or spare parts (Zargar, 1989a).

The invasion of Iran was launched shortly after the Islamic Revolution by Saddam Hussein. The Country was taking its first step towards rehabilitation, recovery and recognition according to the new priorities when it was attacked. Without the foreign imposition, this transition would still have been complicated and perhaps in some respects painful. Defence and liberation were deliberately made the main priority and, somehow overshadowed and thus postponed the traditional stage. After the cease-fire in 1988, the Country was struggling with two major interlinked tasks:

1. the transformation of the Country towards the values and merits of the Islamic society promised by the revolution; and
2. the replacement and reconstruction of huge amounts of destruction sustained over the

eight years of conflict (Ibid).

In analysing the impact of the War, Motawef (1996) argues that the Iranian Government could manage the War for eight years in spite of being faced with an international military and economic embargo. He says that Iranian revolutionary leaders could use the War environment to mobilise the masses to contribute to the War, but also to consolidate new Islamic institutions. Minorities had also been encouraged to participate in the War, but with less success it could exploit the same environment to mobilise the masses to participate in the early reconstruction programme. He divides development programmes throughout reconstruction into four periods: the first and second periods are considered to occur during the War (1980-1988) and the third and fourth period after the cease-fire (1989-1994). They are:

1. First Period (1982-84): Development Through Reconstruction; (in which the expectations for the start of a reconstruction programme were raised by both government and the people, especially after the liberation of Khorramshahr on 24 May 1982. The aim was to restore pre-War conditions and simultaneously to carry out some development programmes. The revolutionary leaders' support of the poor and their emphasis on self-reliant development and independent economy beside the general belief that public participation as an essential underpinning of reconstruction strategy and some other issues were the characteristics of this period.)
2. Second Period (1985-88): Reconstruction Postponed; (in which the Country was in economic crisis. Amirahmadi (1990) says that the international oil-price, which had been at its highest ever level of US\$39 per barrel at the early 1980s, fell to below US\$10 by 1985. This created new circumstances for all the oil-countries and especially for Iran which relied on oil-revenue to cover 90-95 per cent of its Government's annual budget. Many surveys also showed that undertaking reconstruction works while local people had not yet returned to the War-Damaged areas had resulted in significant failure in this period.)
3. Third Period (1989-1992): Reconstruction Within Development; (in which the War

came to an end in July 1988. Evidently a new national plan or programme would be needed to deal with the restoration of the economy as well as the built environment. Seeking the priorities between reconstruction of the economy or the physical reconstruction, many, including senior staffs of the Government and academicians, suggested reconstruction programmes within the development process. This was also resumed in the First National Development Plan after Revolution [the Five-Year Development Plan (1989-1994)] which was submitted by the Government and approved by Parliament in 31 January 1989. The First Plan aimed to resume the development process including the reconstruction programme⁸. } and

4. Fourth Period (1993-1995): Reconstruction Within Economic Reform. [In this period policies related to reconstruction changed according to the new economic policies that of privatisation and market-oriented approach, therefore full involvement of public sector in reconstruction had to be changed. The change concerned two goals: harmonising reconstruction within economic reform; and terminate the programmes by 21 March 1995. Furthermore, the lesson learned from the reconstruction of the earthquake of June 1990 in Zanjan and Gyllan provinces influenced the reconstruction policy of War-Damaged areas to consider the local people and mainly the victims responsible for controlling the programmes as well.]

The masses were encouraged with great success by the Friday-Mosques's Imams and also by the Government to form volunteer paramilitary forces to join the battle against Iraq or to donate money to finance the War. The establishment of some of these new Revolutionary organizations started in May 1982 when the whole nation was called to take part in the reconstruction programme. Some NGOs⁹ were formed by Friday Mosque Imams to mobilise available work force and facilities from all around the Country and to carry out rebuilding works required in the War-Damaged areas. Huge numbers of people and many facilities began

⁸ Minister of Economy and Finance Mohammad-Khan said the First Plan saw a gradual shift from oil revenues to diversified production and development especially in the infrastructural sector such as power generation, water supply, dam building, roads and transportation and irrigation (Ettela'at, Wednesday, Aug. 2, 1995).

⁹ Non-Governmental Organizations

to arrive in the War-Damaged areas which included 'Assistant Groups' organised by the Friday Mosques under new and rapidly-formed religious-revolutionary NGOs (Ibid).

Reconstruction started with great public support and with mobilisation of a great amount of facilities and Manpower. But, Motawef (1996) claims, there had been no prior planning by central government or local offices and the new voluntary organisations lacked internal organization and inter-organizational coordination. Therefore, there was great disorder at the start. In an attempt to rectify this problem, the same source indicates that the central government made each voluntary organisation responsible for a specific area. Reconstruction of the War-Damaged rural areas was placed under the control of two semiformal Revolutionary Organisations: 'Bonyad-e Maskan' (Housing Foundation) and 'Jihad-e Sazandegi' (Construction Crusade). The former was to deal with housing reconstruction and the later with other issues related to the reconstruction tasks. The Assistant Organisations and NGO groups remained responsible for the reconstruction of nominated towns.

The conflict between local culture and that of volunteers from different parts of the Country, the high expectation of the local War-Damaged victims which was created by centralized mechanisms of using the nation's potential and a perspective of the longer-term future of the ideal society, proposed by the Islamic revolutionary leaders and other theorists, were some of the disadvantages of this kind of mobilisation and popular participation which have referred to by many commentators for the initial period (1982-84). In relation to the imposed global shift in the people's life style in the disaster-stricken communities, Zargar (1989a) says that an 'unfamiliar' settlement could only become another burden disrupting their social and economic life. He observed, particularly in the reconstructed villages of Khuzestan Province, that the traditional life often continues in the new settlements where the design of the buildings, site layout and so on were decided by the villagers themselves or were similar to the traditional forms. The best result were to be obtained when the inhabitants expressed their ideas and needs and more importantly decided upon and became directly involved in implementing the reconstruction projects.

People participation was sought for both forms of reconstruction. In the War-Torn areas,

people's aid in terms of labour and money was organised centrally. There was great enthusiasm for help in the aftermath of the War. This aid was actually for the greatest part from outside the region since the whole Country was concerned to see the appropriate reconstruction of towns and settlements. During the eight years of the War, the process of reconstruction could not be set up by the people directly influenced. The people were not able actually to live in the areas affected. Unconsciously, new plans, not based on the previous ones, were implemented by the Government. In the conclusion of his thesis, Motawef (1996) rejects government involvement in reconstruction programmes and writes:

"It seems that deep government involvement in reconstruction and development projects usually tends to injustice resources distributing, providing different people with unequal opportunities and losing time and resources. Direct central government involvement in the planning stage specially ends in unrealistic suggestions and policies which create many problems in implementation as well as dissatisfaction of the local people. The central government also usually gives false signals misleading people when it is full dominated on most aspects which usually results in more loss. Thus, the question remains why central governments do not leave what could be left to the local people to do themselves?"

Analysing the economical impact of the centralized government involvement in reconstruction, the same source observed that the delay caused by the Reconstruction Plan and importantly the uncertain reconstruction policies put the households in bad conditions to face the severe inflation of 1992. This raised the construction cost to four times more than if the households were allowed to rebuild their houses earlier. So, it suggests that the early start and completion of reconstruction is the most significant factor of the reconstruction success and the Government commitment to reconstruction, therefore, was going in a wrong way. Instead of facilitating households to do their works privately, the rigid regulations obstructed and reduced their abilities to do reconstruction, for a long time before 1992.

5.5.2. Reconstruction of Damaged Areas following the Earthquake in Gillan

The best available evidence referring to the analysis of the reconstruction of damaged areas

following the earthquake in Gillan¹⁰ is a report named 'On the Reconstruction of Housing in Gillan and Zanjan Regions Following Earthquake: 1990-1992' published by the Bonyad-e Maskan-e Inghelab-e Islami (Housing Foundation)¹¹. Akhoundi (1992), the Head of the Foundation then and the Minister of Housing and Urban Development from September 1993, is the author of the report. This Foundation was set up after the Islamic Revolution to act alongside the Ministry of Housing and concentrating on the needs of the people in the villages, in particular the poorer sections of society. This is a part of the political structure within Iran where the Islamic Government has inherited a secular economy from the Shah's regime and also continues its previous practice of funding projects from within the community.

In the introduction to the report after a brief definition of disasters, crises and the responsibilities of the Government towards solving the problems, Akhoundi claims that a comprehensive plan should be considered. He maintains that the objective of the report is to outline intensive discussion of the parameters of his experience in the reconstruction of damages from 1990 to 1992 following Gillan and Zanjan Earthquake.

Criticising the Red Crescent, one of the relief agencies, the same source pinpoints the ways people can be organized for a participatory approach. It asserts that in the aftermath of the Roudbar-Manjil (Gillan) earthquake, although this organ was very active in the situation, it nonetheless took no main role in organising and overseeing the relief activities. The relief work usually undertaken by groups of teenagers trained by the organisation, but this time these groups were not involved. This led to an influx of volunteers who wanted to help but who were disorganised and were not being trained causing conflict and difficulties in itself.

The same writer believes that the Government tried to return the situation to normality very quickly and injected into the area a large number of facilities over a very short period. He

¹⁰ In Gillan and Zanjan earthquake, three cities: Roudbar, Manjil, and Tarim suffered serious damage and a number of other cities like Rasht and Qazvin were also affected.

¹¹ Vice Chairman of the Housing Foundation, Javad Haqshenas, announced that some 80,000 houses have been built in the War-Torn regions and 200,000 others in the quake-stricken provinces of Gillan and Zanjan By the Foundation. He said that the foundation reconstruct 70,000-75,000 houses annually. He concluded that the foundation is presently engaged in renovating 45,000-50,000 houses in rural areas with a RIs. 200 billion credit (Ettela'at, Friday, Oct. 13, 1995).

continues to voice his concern that many implications of the decisions were beyond the capabilities of national and regional groups and required input from international bodies. He believes that it is possible even within crisis to find time to develop differently, since people are dealing with change and process. In this regard, he suggests, for example that people's participation can be used in the social and economic aspects of reconstruction, education, development of technical skills, the creation of new opportunities for employment, protecting new property and capital wealth and the physical expansion of the cities and villages.

Between two directions: one returning people to a normal situation and another pushing them towards development, the same source suggests a point of balance which needed to be achieved. But, any decision-making should be done with the active consensus of both the victims of the disaster and the Government and not left to the Government alone. It goes on to criticise the reconstruction in Manjil by pointing that a total of 158 villages were resituated and that this was not logical or necessary in every case. It appreciates the value of the work of the Government in the region, at least because no other organisation is a position to do the job so well, but it does not mean that the same style of work should be repeated without proper consideration of past mistakes and successes.

In suggesting the necessity of activating regional organisations, the report points to the fact that local organisations often do not have enough confidence during times of crisis, but that the regional organisations still would have enough power to lead the situation, if given the opportunity. However, the national organisations and agencies, assuming that the regional organisations are not efficient enough, immediately send in relief agencies. This in itself requires time and money and implicates people who do not know the place. Experience shows that these groups ought to be under the control and management of the regional organisations who have local knowledge. Supporting this as a possible way of working, it refers to the experience of the reconstruction of damaged areas after the flood at Zabul, within the province of Sistan va Baluchistan, when outside relief agencies from Kerman, Yazd and Khorasan were successfully coordinated by the province. In the case of the disaster in Gillan region where they took consideration of this experience into account, it was decided that responsibility for the reconstruction of housing be given to Gillan's Housing Foundation,

rather than resting with the Government (Ibid). It should be noted that this was a change of policy to a kind of 'bottom-up' strategy of development¹².

The standard policy for coping with disasters is to provide shelter in three stages: the first is the immediate provision of camps (tents, huts, etc.); the second is the construction of temporary shelters; and the third is the reconstruction of the permanent fabrics. What actually happens is that after the first stage, the region enters a new situation and the victims, after finding their confidence, want to decide about many aspects of their lives and to take responsibility for much of the decision making.

Akhoundi (1992, p. 11) admits that the lack of a unified and coordinated approach means that many of the victims of the disasters have come to complain. But, those victims who were allowed to participate in the building of their temporary housing, although they received less help and support, were more satisfied than those who received more help but were less able to participate. The styles of building and the methods of construction were also a matter of criticism because they were disparate and disorganised, not decided by the established regional committee who normally deals with the technical details of the design and building of structures, but unconsciously of the different aspects of government through its various factions and organisations.

The same source has some suggestions for different stages of the reconstruction which seem to be a kind of 'bottom-up' approach and celebrate the notion of people's participation, the use of local resources, etc. It is very close to some aspects of the model of endogenous development. In particular, it might be claimed that this is a working example for the use of both abductive and inductive approaches in making feedback controls. When the Government

¹² Iran is vulnerable to natural disasters such as earthquakes, floods, bushfires and typhoons. In the past 60 years, the Country has undergone many damages caused by earthquakes, e.g. Salmas in 1930, Doroud in 1953, Boein Zahra in 1962; Tabas in 1978; Golbaf-e Kerman in 1981; and Roudbar and Manjil (also known as Gillan and Zanjan earthquake) in 1990. Rasul Zargar (1995), Head of Natural Disasters Head-quarters at Interior Ministry, said that Iran ranked 10th in the world countries list for the rate and variety of natural disasters occurring there and extent of damage. He added that so far 40 different kinds of natural disasters have been identified in the world, of which 31, including flood, earthquake and frost occur in Iran. Zargar concluded that 180 out of 242 Iranian cities were seriously threatened by quake.

and agencies provide money and resources to rebuild people's lives as a whole entity they are helping in an inductive way. At the same time, this idea is trying to use people in an abductive approach, in the more detailed and precise areas of building and construction. Supporting the idea that people's participation works, Akhoundi discusses generally the stage of permanent settlement and conducts six technical and experimental lessons from Gillan's reconstruction:

1. the provision of temporary shelters is not something separate from other aspects of the reconstruction process;
2. the avoidance of resituating people and placing them into camps outside the region; (They should definitely be sited within the region.)
3. in order to consider technical issues to reduce expenditure and to avoid repetition, it is necessary to give the responsibility for temporary housing and reconstruction to one organisation; (At the same time, this should improve the efficient and accurate documentation of families and the disaster they have suffered to their household.)
4. temporary housing can recycle building materials from the damaged areas and use the labour of the people involved; (the Government then gives them any extra materials, money and technical aid they need. In the future, the temporary housing can be reused, for example as stables in villages.)
5. financial aid, trust funds and other forms of aid can be set up for these purposes; and
6. this stage can be seen as an isolated part only in those situations where victims and their families are obliged to leave the region for one year or more because immediate reconstruction is not possible.

Introducing the programme of reconstruction of settlements in Gillan and Zanjan, he tries to illustrate the objectives by saying that the main aim is to revitalise the community and populated centres, preparing conditions for employment, permanent housing and the

reconnection of environmental services within the capabilities of the region and of national plans. Then, he suggests that understanding the region and its capabilities for local and regional growth, through people's participation and investigating of national support mechanisms, will set good foundations for long term development. Therefore, comprehensive and strictly designed long term plans should be avoided in preference to gradual development growing out of the actual situation.

Some fundamental strategies and approved policies, which have been legislated for, are referred to in page 15 of the report. These also seem to be very close to the soul of the endogenous development model and it becomes clear that Akhoundi (1992) is attempting to develop a lateral structure for organisations seeking to develop roles for the Government and for the people. One of these policies was about management of reconstruction of damaged residential units which can be divided into the three areas of facilitating, design and construction and should be the responsibility of the landlord. The role of the Government (as executors of the reconstruction) should be about cooperation with landlords over matters which are beyond their capacity and also about directing and controlling the programme so that the reconstruction work happens more quickly to a better standard, with fewer problems and less social tension.

Another suggestion of Akhoundi was to establish workshops run by the Government bodies responsible for the execution of the reconstruction in the region, acting in concert with the regional committees already in place and with representatives from outside bodies and strengthening the power of the regional committees. In other words, these government bodies should go to the region and consult with the regional body in the delegation of activities, rather than delegate responsibilities to outside groups. He also suggests that it is the responsibility of the Government to organise the relief agencies from different provinces and use them according to Government reconstruction policy; **to minimise the investment of the Government in housing and to redirect the funds to investment in production or other sectors which will restore the local economy;** to empower the victims' financial situation and invest in the infrastructure and basic requirements. In any case, the architectural plans should be designed or selected with the help of the inhabitants who have survived the disaster.

In the reconstruction of damaged areas following the earthquake, the Government tried to activate the local and regional decision making systems and the methods by which to bring participation into the process via establishing reconstruction committees in the region with the help of local representatives in the cities and with the help of the traditional 'grey beards' (village elders) in the villages. With reference to the severity of the damage, Akhoundi describes a head team made up of professionals and other workers, 'Setad', to consider the reconstruction of housing which was located in Rasht and a system of other teams, 'Setad-e Moeins', from different parts of the Country under their direction located across the region.

Considering that municipal and consultancies in the programmes were necessary, but because the municipal in this area did not have enough technical expertise or local consultants, they tried to bring in such people from other areas. It was important that they try to respond to the rules of the municipal. This is a new scheme within urban design to attempt to keep a lateral organisation appropriate to the area. Because of the scale of the disaster, any international help offered was welcomed into the region which led to legislation from the United Nations General Committee involving the UN General Secretary as responsible for sending a research group to assess the damage and requirements. This was very successful and three reports were produced. In one of these reports, research systems were designed for the facilitation of all the technical expertise and resources within the Country dedicated to the reconstruction projects. The involvement of the UN also led to the creation of a scheme for the collection of information concerning expertise and technology from universities and other international consultancies. At the end of the report, Akhoundi hopes that the results of this work are not permanent and asserts that everything is in the process of change, but a comprehensive plan will reduce the bad effects of the ugly scene of the situation in the future.

Summary and Further Discussion of Supporting Practical Schemes

The main objective of propounding the case studies presented above was to look at meeting the real needs of the people. This was considered to be a revolutionary approach. The choice of people over government, regional authorities over national and outside groups and university staff over consultants were made as an attempt to locate the work closer to the people and their needs. But, the stimulus and schemes of the development programmes were

provided by outsiders and the specialists. Development was assumed to be particular and separate from ordinary life and therefore people needed to be taught how to adapt. In fact, the initial objective was to seek ways of getting quick results for their projects rather than any qualification of the people's lives. A participatory approach was employed as a means for that end. They were all focusing on the processes which were accomplished by deductive (using people in executing the programmes) and sometimes abductive reasoning (using people's knowledge), thus their attempts were far from reaching an inductive approach. To gain the inductive approach as fully discussed in Chapter Four, there needs to be a revolutionary change of organization. People and governments should meet each other in one organization as an entity which does not have top and down distinctions. People need to evaluate the outcomes of development programmes and induce the results by feedbacking and controlling the information into values. This in turn will be either an impetus for new projects or a seed for cultural evolution and transformations in a long term and open-ended process.

Defining this research, the author has benefited from his interviews in summer 1996 with some key figures who were involved in these practical schemes. Some of their ideas have been included within the description of the case studies. Their views about endogenous development can be condensed as follows:

a) Hamid Ghandehari¹³ mentions that in development processes people do not need tutors and experts can not and should not be their inspirations. Therefore, experts should participate with people in the process of their lives. His model of development is idealistic, similar to the characteristic of natural organisms, which contains endogenous growth based on evaluation, selection and action. Rather, he claims that in human societies the combination of these is more complex and divergent. He considers human organizations as ideal-seeking systems. These ideals should be achieved by experience and cannot be inherent. By interfering endogenous development process, not only we destroy external results, but also people's intention. In endogenous development there are both criteria and regularity which involve responsibility. Sustainability is dependent upon this regularity. He brings an example about

¹³ Ghandehari was the Shahid Beheshti's lecturer and the development project manager of Mobarakeh Steel Complex. He has also exercised the same idea in few other regional and national planning projects.

planting a seed and says that there is no need of having knowledge about the complexity of the seed, rather we need to know how to plant and water it. For him, science is not the generator of life, but it can predict its destiny. We cannot substitute ourselves as planners with society as an alive system, but it is possible to guide it. He claims that endogenous development is an approach and methodology which can lead to a design or a plan based upon this methodology. He asserts that experts cannot understand the problems but they can familiarise themselves with them. He claims that professionals should learn things that they do not know, instead they are dealing with false problems. The aim of participation for him is the continuity of life. It is not for solving problems or implementing a project. The case for him is that Man is not tutor of the others and does not have all their knowledge, therefore he should not try to substitute human society in his programmes and the solution for it is to give them responsibility to make decision about their problems via their experiences. Now, each case has its own principles. Ghandehari does not divide government and people from each other and believes that they can participate in many cases like the other parties.

b) Professor Seyyed Mohsen Habibi¹⁴ believes that the experts should not exceed more than one step from people in development programmes. He takes long term plans as unnecessary attempts. He suggests that government's works should be centralized (i.e. laws, defence, etc.) and people's works decentralized. He believes that national plans in Iran are centralized, regional plans are semi-centralized, therefore endogenous development plans should be decentralized, but concerning the two. Habibi also maintains that solutions should be derived from the real situation by the people themselves. In this regard, his emphasis is on search for three key elements in each case: fulcrum; lever; and mobilisation of resources and people themselves. People's participation, for him, should be all about executing and carrying out the plans and programmes which have been suggested by experts (deductive approach). Habibi suggests searching for 'what can be done?' He accuses those who attempt to find answers for 'what must be done?' and claims that they are utopian. He agrees with the idea that people make the future and experts should predict that.

¹⁴ Habibi is the senior consultant of Housing Foundation who participated both in War reconstruction projects and in reconstruction following Gillan's earthquake. He has supervised more than fifteen national projects using bottom-up approach. He is also a senior lecturer in Urban Design in Tehran University.

c) Dr Ali Ghaffari¹⁵ believes in the unlimited potential of people and regional resources which have not been used in appropriate ways, rather they became abortive by administrative interferences. He looks for a balance between governors and governed and between top and bottom in a hierarchy. He claims that governments are for people but their authorities should be under control. He emphasizes regional authorities and refers to different styles and diversity of the products in built environment that cannot be produced by centralized decision-makers. Ghaffari considers all people as designers and claims that the problem is with the differences between old and new designers. The old experts had a holistic approach and their designs were comprehensive, but the new designers are more specialized. He says that traditional professions usually adapted themselves to universal attitudes towards the environment. The success of traditional ways of building the environment, for him, is because of both people's innate knowledge and their adaptation to the environment.

d) Amir Farjami¹⁶ claims that reconstruction in Gillan after the earthquake was more successful than after the War¹⁷. He admits that the Government could improve its policies and strategies of reconstruction and use them in Gillan, e.g. replacing compensation with long-term loans. He believes that except juridical and defence issues, people can govern themselves, especially in rural areas, and the role of central government should be all about facilitation, supervision and control. In Gillan, the policy was to reconstruct the existing local organizations and accelerate their activities by using the same models and programmes which were used before the earthquake. This helped the victims of the disaster to stay in the area and to participate in all the decision making. Farjami believes in long-term development and does not preclude the possibility of using obsolescent organizations, rather he claims that some new revolutionary and lateral organizations can be viewed as obstacles for development. Finally, he suggests that the presence of indigenous people is the only solution for the problems of

¹⁵ Ghaffari is the head of Architecture Department in Shahid Beheshti University, senior lecturer and a member of a Council in Ministry of Higher Education. He was also assistant manager of Mobarakeh Isfahan project and active in reconstruction of War-Damaged areas, especially Khosestan.

¹⁶ Farjami is the Vice Chairman of the Housing Foundation who has the experience of reconstruction of War-Damage Areas and reconstruction following the earthquake in Gillan and Zanjan.

¹⁷ Farjami claims that the Housing Foundation could finish the reconstruction of the earthquake by providing 200,000 residential units in Gillan and Zanjan after nearly 3 years, but the same institution could only reconstruct 76,000 units in War-Damaged Areas after 15 years.

both development and reconstruction, especially in rural areas.

e) Seyyed Abbas Jazayeri¹⁸ distinguishes people's participation as a key element for development and claims that whenever the Government faces a difficult situation no project is successful without people's participation. He believes that in Developing Countries where experts are less and projects are more, people's participation is the best strategy. For him, people's participation has been an effective strategy not only in small projects, but also on national scale. He says that in destroying the Shah's regime; establishing the Islamic Republic of Iran; in the War; and in reconstruction¹⁹ the same strategy was used. Decentralising the Government and localizing its power, Jazayeri claims that people's participation was considered as a key point. Accordingly, they could shift the decision making to lower level of the Governmental organization, e.g. for the first time in Iran's history, the provincial budget is sent to a governor who should set up planning committee which consists of national and local members to prove county projects for sending to the Programme and Budget Organization to be financed.

f) Dr Mehdi Taleb²⁰ who is a sociologist does not regard endogenous development without exogenous model as a workable concept. He suggests that for Iran, considering its geopolitical and historical background, an exogenous model of development is the only advisable fact, but we should think about how to adapt with it. He believes that the Country has a strong hierarchical social structure with central governments in her long history which makes it different from the other parts of the world. In this regard, he suggests that development should start by the central government's permission. He acknowledges the external influences as essential factors for development and claims that Iran has lost her

¹⁸ Jazayeri is assistant director of Natural Disasters Head-quarters at Interior Ministry.

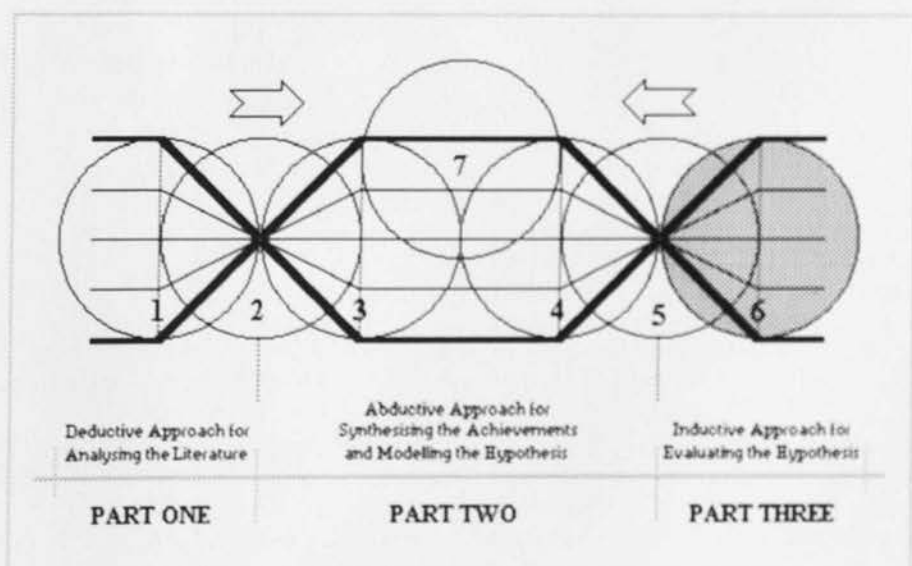
¹⁹ Jazayeri confirms that they have learned many lessons from the experience in reconstruction following the Gillan's earthquake which have been used in reconstructing three other heartbreaking events: Zabul's Flood (1991) in which 1050 residential units were damaged; the Flood of 1992s in which the losses of life and properties (213,254 residential units were damaged) were equal to that of Gillan's and inflicted 12 provinces, 47 townships and 7,000 villages; and Firouz-abad Earthquake (1994) in Fars Province which damaged 33,000 residential units. Beside these, there were floods in Khosestan and Khorasan provinces, increase of the Caspian Sea level and many other disasters.

²⁰ Taleb is a social consultant of the Ministry of Housing and Urbanism and a senior lecturer and the head of the Cooperation and Social Security Group of the Social Science Department at Tehran University.

potential to stand on her own lots. He is pessimistic about independency and self-sufficiency and considers all internal development programmes a part of or determined by the others. His suggestion for development is to think about adaptation with these super structured and external influences as environments of the designed systems. He believes that all cultural, scientific, economic revolutions are under the influences of the political changes without which these revolutions or new ideas are all utopian. Therefore, he believes in reforms.

Finally, this study suggests that usually governments, as the preactivists, prefer the best in short-time than better in long-term future. The best they do is to accelerate their programmes using sometimes people's participation. Therefore, their participatory approach is deductive. They do not stay to receive the feedback of their actions, thus their planning has one-way access, from top to down. On the contrary, the model of endogenous development suggests transaction between governments and people; producers and users, being concerned about natural process and feedback control. Therefore, the emphasis of the thesis is on the quality of life by considering two other approaches in using people's participation, i.e. using the source of knowledge and technology embodied in indigenous society (abductive approach) for solving the existing problems and their value judgement and wisdom for resolving the problems (inductive approach) and sustaining the society in a long-term development.

CHAPTER SIX QUESTIONNAIRE



6

QUESTIONNAIRE

Introduction to Questionnaire

6.1. **The Methodology Used in the Questionnaire**

6.2. **The Questionnaire**

6.3. **The Analysis of the Questionnaire**

Conclusion of Questionnaire

Introduction to Questionnaire

When confronting a real situation of life and its changes, it is very important to consider people who are the main source of transformation and evolution of culture which, in turn, sustain the process of the life itself. To get information about people's feelings, opinions, likes and dislikes, the author carried out a social survey, an 'open-ended questionnaire'. These questions are semi-structured and ask people (Iranians) about the reasons of their responses in order to have their opinion about philosophical issues about changes and development of their lives in-depth. Then, an inductive inference has been adopted to maintain the habitual notions and established values of the field survey by analysis of the collected data; and an abductive inference has been employed to test the hypothesis by reflecting further theoretical issues on the findings of the data analysis. Accordingly, an attempt has been made to use mixture of two research methodologies, i.e. 'qualitative' and 'quantitative' research¹.

6.1. The Methodology Used in the Questionnaire

The discussions about the nature and relative virtues of quantitative and qualitative research reveal a mixture of philosophical issues and considerations of the virtues and vices of the methods of data collection with which each of these two research traditions or mixture of them is associated. Quantitative research is typically taken to be characterised by the social survey and by experimental investigations. Qualitative research tends to be associated with participant observation and unstructured, in-depth² interviewing. In fact, philosophical issues

¹ One of the examples of the use of quantitative and qualitative approaches within a strategy of mutual corroboration is Cook's (1984) study of the influence of parents' gender on the way they experience having a child who is dying of cancer. For the qualitative side of her investigation, she used a lengthy interview schedule which comprised a large number of 'open-ended' questions. However, as is often the case with studies in which quantitative and qualitative research are combined, one method of data collection tended to be accorded greater prominence than the other. There are number of thesis and dissertations which have used open-ended questionnaire, for example those which have been supervised by Dr F. Ujam in Edinburgh College of Art. They have used different case studies and different ways for interpretation and analysing the responses. In this thesis, the quantitative data collection through semi-structured open-ended questionnaire is the hub, while people's responds put 'flesh on the bones' of the statistical findings.

² Qualitative researchers describe the data deriving from ethnographic work as 'rich' and 'deep', often drawing a contrast with quantitative data, which tend to be depicted as superficial. They tend to view survey research as a source of 'surface information' which relates to the social scientist's abstract categories. By contrast, the quantitative researcher may be suspicious of the limited generality of a study of two dozen men in one area of one city (Liebow, 1967).

differ very strongly and have much to do with a growing interest in the methods associated with a qualitative style of inquiry. Usually, qualitative methods, such as participant observation, tended to be regarded as relatively marginal in the context of the social scientist's defence of data collection techniques (Bryman, 1988).

The same source indicates that since 1960s, when the debate about quantitative and qualitative research took root, writers often recognized the potential strengths of participant observation. The tendency was to view it as simply a procedure for developing hypotheses to be supported by the more accurate survey, experiment or whatever. Blalock (1970, pp. 45-6) describes participant observation as a technique: "extremely useful in providing initial insights ... that can lead to more careful formulations of the problem and explicit hypotheses. But, they are open to the charge that findings may be ... difficult to replicate. Therefore, many social scientists prefer to think of participant observation as being useful at a certain stage in the research process rather than being an approach that yields a finished piece of research." Such a statement means that the role of qualitative techniques are very restricted and do not maintain the solidity of research designed within a framework shaped in the scientific method.

Increasingly, the terms 'quantitative research' and 'qualitative research' came to signify much more than ways of gathering data; they came to indicate separate assumptions about the nature and purposes of research in the social sciences. The terminology, seems to imply that 'quantification' or its absence, is the central issue. Indeed, most writers have proposed alternative terms. For example, Guba et al. (1982) propose a contrast between rationalistic (i.e. quantitative) and naturalistic (i.e. qualitative) paradigms, while Evered et al. (1981) use a contrast between 'inquiry from the outside' and 'inquiry from the inside'. Magoon (1977) and J. K. Smith (1983) refer to 'constructivist' and 'interpretive' approaches respectively in place of 'qualitative'. However, the quantitative/qualitative tends to be still the main focus.

Comparing the two approaches, there is evidence suggesting that they are both capable to deal with the social problems and reflect sociological concerns. But, they are very different in style and approach. Their chief elements in a list of contrast are that the quantitative research seeks to test the validity of theories and the samples are predefined at the beginning of the research

and the results and analyses are as causal propositions in the form of tables. On the contrary, in qualitative research it seems researchers let their subjects form their focal concerns while maintaining an awareness of the literature on it. Their samples are determined by whom they meet and contact with during their fieldwork and are constantly shifting. Their research involves different degrees of association with each person. They usually use a much less standardized approach relying on observation, conversations and some informal interviewing. The results are in the form of quotations which reflect what their subjects deem to be important about people's lives and their analysis is 'descriptive' which is concerned with the people's perceptions of changes in their life-style. Regarding to this concern, people's perceptions, which have been reflected by their responses in the field survey, are classified into four categories in this thesis emphasizing four styles of research analyses: 'descriptive', 'explanatory', 'simulative' and 'evaluative' (Figure 6.1).

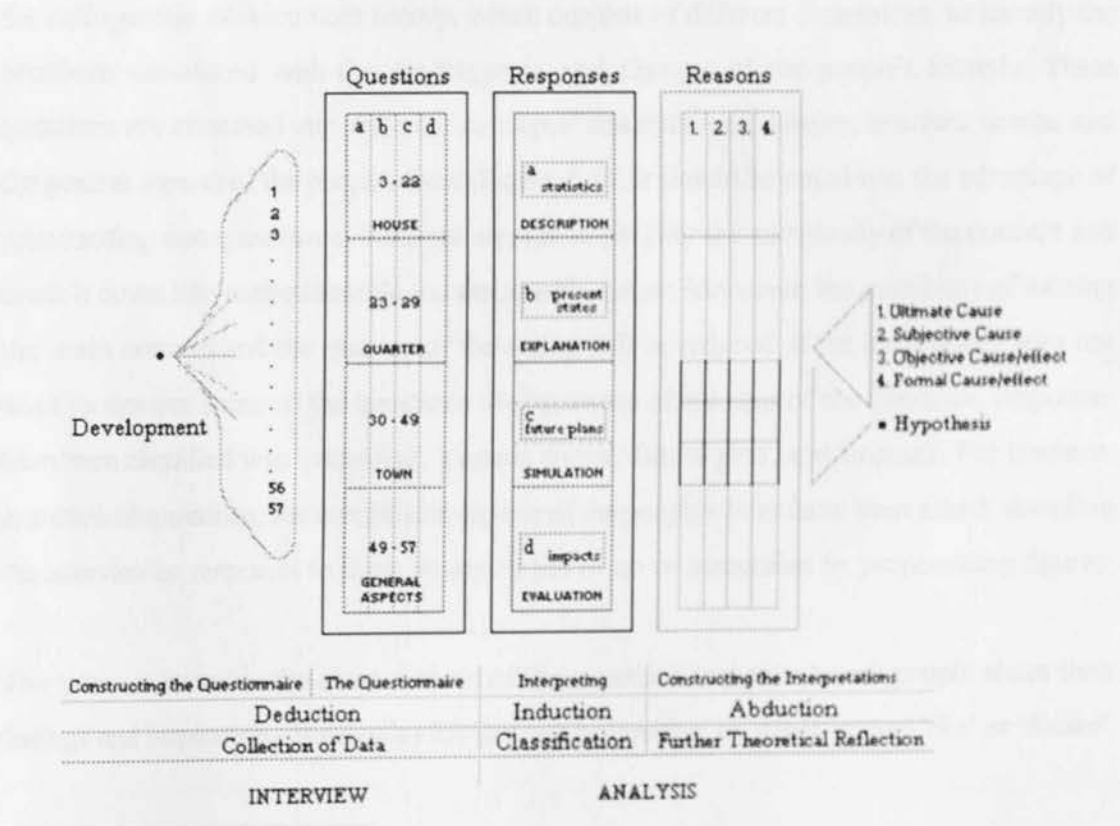


Figure 6.1 The diagram shows the approach adopted to the collection and analysis of the data under this study.
Source: the author

The thesis's concern is to focus on the subjective understanding of how people live, feel, think,

and act, therefore, to understand the world from their perspectives. Its adoption of a perspective, which emphasizes the way in which the people being studied understand and interpret their social reality, is one of the most central motifs of the qualitative approach. However, these two methods can be summarized as: quantitative research reflects a concern to follow the methods and procedures of the natural sciences, e.g. it is viewed as **deductive** approach and concerns with variables, causality, and so on; and qualitative research could then be viewed as an **inductive** and **abductive** approaches that deliberately avoid the natural science approach and prefer, instead, to ground investigations in people's own understandings of social reality, either general or specific.

Regarding the above definitions, the author has adopted a deductive approach to design a semi-structured questionnaire with 57 questions. These questions are the result of deducing the endogenous development theory, which consists of different dimensions, to identify the problems associated with the development and changes of the people's lifestyle. These questions are classified into different concepts³ and scales, i.e. houses, quarters, towns, and the general aspects of the people's lives (Figure 6.1). It should be noted that the advantage of propounding one question in different ways is to simplify the complexity of the concept and break it down into understandable and discussable matter. Moreover, the possibility of missing the main content and the essence of the dialog will be reduced, if the interviewee does not want to answer some of the questions. Being aware of the aims of the questions, responses have been classified into 'statistical', 'present states', 'future plan', and 'impacts'. For instance, in statistical questions, the quantifiable aspects of the people's lives have been asked, therefore the interviewee responds to them by saying yes or no or sometimes by propounding figures.

The 'present states' is the characteristic of the questions that aims to ask people about their feelings and inspirations of everyday life that can be 'positive' or 'negative' and 'like' or 'dislike'.

³ To define the differences between image and concept, Ackoff et al. (1972, p. 167) conduct an argument which also refers to the meaning of the words 'description' and 'explanation'. They suggest that 'concepts' are not iconic: they do not look like, sound like, and so on, what they signify. For them, 'concepts' are individuated sets of functional properties of objects or events that explain particular phenomena of communication; and 'images' are individuated sets of structural properties and the relationships between them to which subjects respond. Whereas, 'images' help us 'describe', concepts help us 'explain'. Herein, they found the differences and suggest that: "images connote structural properties, but concepts connote functional properties."

Their attitudes are also different in reflecting their ideas about the structure of their lives considering temporal changes. This might be either about their desires and aspirations, their opinion about change of their environment or their plan for/about the future. Finally, another concern is to know about the relationships between the components of the people's lives and their environment. In a broader context, interconnection between the components of a system within its boundaries from one hand and its relationship with other systems or its environment on the other hand, are expected to be chased by the last cluster of questions, i.e. 'impact'. It is possible, therefore to predict the direction of the responses and interpret them much easier, if the questions are precisely structured. Getting insight the complexity associated with the analysis of the collected-data in this survey, a brief discourse about the similarities and differences of the two traditions have been constructed in Appendix Two: Section (a).

The field survey in this thesis is about a mixture of interviews, observational data, documentary evidence, and quantitative data. It is possible then to conduct cross-site analyses of the data and to integrate the results with the survey findings. This 'structured ethnography' [as Smith et al. (1982) call it] departs from conventional qualitative research in several ways. The need to investigate specific policy initiatives makes it much more problem-focused than conventional ethnography. This approach contrasts sharply with the qualitative researcher's dislike of structured investigations. But, in this research things are a little bit different. **Concerning the problems which people confront in development process, the hypotheses aimed to construct the questions and then a semi-structured open-ended questionnaire evaluates the responses with the criteria resulting from the hypothesis.**

Furthermore, an important contribution of descriptive detail for the ethnographer is to the mapping out of a context for the understanding of subjects' interpretations of what is going on and for the researcher to produce analyses and explanations which do justice to the milieus in which her/his observations and interviews are conducted. In this regard, the author carried out 57 questions, which are distributed among 29 people and presented in the followings.

6.2. The Questionnaire

In July 1995, A questionnaire was conducted in Persian, the language the participants could

use which was no longer or more complex than they could grasp in the time available and able to hold their attention and interest [see Appendix Two: Section (c)]. The main objective of this questionnaire was to ask Iranian citizen and those from rural areas about their roles in designing their society's future and the built environment. In this regard, the authors aimed to investigate the root of the problems in development programmes from the people's perspective. Following the questions about general description of the respondents, 57 open-ended questions, containing different criteria, had been conducted which are briefed as:

1. Which kind of family do you have?
2. How many people live in your family?
3. Do you have a house or houses of your own?
4. What is the nature of the ownership of your house?
5. How long have you been in your present house?
6. How long do you expect to stay at your house?
7. Mention (3) reasons why you have chosen this current house?
8. Mention (2) important changes happened after moving to this house with regard to facilities, opportunities, the neighbourhood, jobs, etc.
9. Mention (3) aspects you do not find satisfactory in your present house. Please give (1) reason for each.
10. Mention (3) things make you satisfied with your house. Give (1) reason for each.
11. Have your children secured house for the future? How was this possible?
12. Have you made any changes in your house? Please give (2) examples and (1) reason for each.
13. Mention the (2) most preferable things you would like to have in your house. Give (1) reason for each.
14. Do you think there is any possibility for people to build their own houses without the help of the local municipality? Please mention (2) ways of achieving this.
15. Which type of houses do you most prefer? Please give (2) reasons.
16. Would you like to design your house yourself or ask others to do it? Please give (2) reasons why.
17. Has your choice of present house had any impact on your job? Please give (2) examples.

18. Is your work far from your house? Please give (2) reasons why.
19. Are people involved in production of housing? Please give (2) reasons for your response.
20. Do you feel that your house can resist disasters (earthquake, floods, war, etc.)? Please give (2) reasons.
21. Mention (3) things people or the authorities usually do during disasters.
22. Mention (3) important ways which help towards having a house.
23. Mention (2) things you like in your neighbourhood and give (2) reasons for each response.
24. Mention (2) things you do not like in your neighbourhood and give (2) reasons for each response.
25. Mention (2) things you would like to have in your neighbourhood.
26. Do you like to be aware of the events happening in your neighbourhood? Please give (2) examples how to achieve this.
27. Do you prefer to live in a neighbourhood where your wider family live? Please give (2) reasons why.
28. Did you choose your neighbours? Please give (2) reasons why.
29. Does your neighbourhood have positive aspects of the past that you like? Please give (2) examples.
30. What are the (2) most important buildings in your town? Please give (1) reason why they are important.
31. Mention (2) buildings you do not like in the town. Please give (1) reason why you do not like it.
32. What are the (2) most important areas in your town? Give (2) reasons why they are important.
33. Mention (2) areas you would like to live in your town. Give (2) reasons why you like to live there.
34. Mention (2) areas in your town you do not like to live in. Please give (1) reason why you do not like to live there.
35. Mention (2) building materials you like to see being used in the buildings of your town. Please give (1) reason why you like it to be used.
36. Mention (2) building materials you do not like to see being used in the buildings of your town. Please give (1) reason why you do not like it.
37. Mention (2) important features you like which have been made in the past of the town. Please give (2) reasons why they are important.
38. Mention (2) events or changes you would like to see in your town in the future. Please give (1) reason why you would like to see them.

39. Mention (2) changes which have been occurred in your town which you like. Please give (1) reason why you like them.
40. Do you think the growth of your town had been depended on imported materials and technology? Please give (1) example.
41. Do you think you and people have enough local resources or means for changing your surrounding? Please give (2) reasons for your response.
42. Mention (2) most important things people do usually in their everyday life which give your town its character. Please give (2) reasons why they are important.
43. Where do you usually go for shopping? Please give (2) reasons why you go there.
44. Mention (2) items you prefer to buy because they are produced in your community.
45. Mention (2) items you prefer to buy because they are produced somewhere else.
46. Mention (3) important things that give identity to the old part of your town. Please give (1) reason why they are important.
47. Mention (2) ways the new generation can know about present values of life.
48. Mention (2) things you would like the formal education to give to you or people.
49. Mention (2) important cultural or social features in your town that are useful to people. Please give (2) reasons why they are important.
50. Please give (2) advantages of traditional architecture.
51. Please give (2) disadvantages of traditional architecture.
52. Please give (2) advantages of new architecture.
53. Please give (2) disadvantages of new architecture.
54. Identify (2) external things imposed on the city which you do not like. Please give (1) reason for each.
55. Mention (2) things you think will give long term life to the town. Please give (1) reason for each.
56. Mention the best way you think which can bring people together to help each other. Please mention (1) advantage of them.
57. Would you like to talk more about your house, neighbourhood, town and your role in designing and shaping the environment?

These questions cover different range of categories. For designing this questionnaire, the

author's intention was to make its presentation as simple as possible and tried to widen its outlook synchronically. Meanwhile, the complexity of the relationship between the questions, considering their types (i.e. descriptive, explanatory) and scales (house, quarter, town, and general aspects) was a matter of concern. These aspects have been also categorised into different concepts such as 'statistic', 'present state', 'future plan', and 'impact' which are referring to quantitative, qualitative, structural and systemic characteristics of the responses. For instance, some questions have statistical answers (i.e. yes/no or a figure); some questions aim to ask about an individual expression of her/his surrounding which have been modified as 'present state'; some of the questions aim to ask about aspirations, wants and desire of the respondents about now and future which are time involved questions and are to trace people's opinion about change and development. These may be fit in 'future plan'. Hence, it is conceivable to say that in designing this questionnaire the approach, in relating these three aspects, is diachronic which enriches the depth of the open-ended questionnaire. Furthermore, it is worthwhile to reiterate that using hypothetic induction, in order to generalise the collected data, will help us to know more about the things which 'actually are', but this classification helps the researcher to particularise the data by employing abduction reasoning in order to show the people's view to the things which 'may be'⁴ (see also Logical Thinking and the Process in Chapter Four: 4.B.3.). The last part of the concepts is tracing an onward relation of each individual and her/his surrounding with other systems, i.e. 'impact'. Accordingly, the first part of the concepts is adapted to the first paradigm of the model of endogenous development, i.e. production process, and the second part is adapt to the second paradigm of the model, i.e. supply-demand relationship.

6.3. The Analysis of the Questionnaire

A 'grounded theory' method has been employed for the data analysis in this research. Accordingly and after collecting the data, it was conceivable to develop a category, which draws on of the basic components of analytic induction, to formulate their relationships with the theory or the model of endogenous development (see Appendix Two: The Problem of the Relationship between Theory and Research, for the idea of grounded theory). Before

⁴ "Science must employ inductive reasoning in order to generalise, and design must use productive inference [abduction] so as to particularise." (March, 1976, p. 18)

analysing the data, an attempt has been made, by the author, to illustrate the general description of the responses. This was made possible by applying a quantitative research methodology considering the statistical responses in the following tables.

A	Age	Sex	Status	Occupation	Ownership	Has been	Wants to be	Family No.	City
1	23	M	B.Sc	Student	Tenant	3 years	1 year	0	Gachsaran
2	72	M	Non - H.	Retired	Owner	16 years	Life time	5 - 20	Tehran
3	29	M	B.Sc	Teacher	Tenant	2 years	2 years	3	Tehran
4	42	F	H. S.	Teacher	Owner	7 years	Life time	3	Birjand
5	30	M	H. S.	Businessman	Owner-tenant	18 years	3 years	0	Birjand
6	43	M	H. S.	Staff	Owner	7 years	Life time	4	Birjand
7	40	F	H. S.	Teacher	Owner	1 year	2 years	6	Birjand
8	41	M	H. S.	Seller	Owner	1 year	2 years	6	Birjand
9	37	M	H. S.	Businessman	Owner	4 years	2 years	5	Birjand
10	70	F	Illiterate	House wife	Owner	16 years	Life time	6 - 22	Tehran
11	52	M	Non - H.	Farmer	Owner	8 years	1 year	7	Isfahan
12	59	M	Dip	Staff	Owner	10 years	Life time	4	Khoramshahr
13	54	M	Dip	Expert	Owner	22 years	No more	8	Tehran
14	43	M	H. S.	Staff	Owner	20 years	Not clear	4	Tehran
15	37	M	Non - H.	Tailor	Owner	4 months	5 years	5	Tehran
16	30	F	Non - H.	House wife	Owner-tenant	20 years	3 years	5	Tehran
17	33	F	Non - H.	House wife	Owner	33 years	Not clear	0	Tehran
18	65	M	Illiterate	Driver	Owner	23 years	Life time	6 - 30	Tehran
19	61	F	Illiterate	House wife	Owner	20 years	4 years	5 - 30	Tehran
20	39	F	B. Sci	Teacher	Owner	2 years	Not clear	3	Tehran
21	44	F	H. S.	House wife	Owner	22 years	No more	5	Tehran
22	34	F	B. Sci	Teacher	Owner	3 years	No more	4	Tehran
23	41	M	B. Sci	Teacher	Owner	3 years	20 years	4	Tehran
24	80	M	Illiterate	Retired	Owner	24 years	Life time	2 - 31	Tehran
25	49	M	H. S.	Staff	Owner	12 years	Not clear	4	Tabriz
26	28	F	B. Sci	Teacher	Tenant	2 years	Life time	3	Tehran
27	45	F	Dip	Teacher	Owner	10 years	Life time	4	Tabriz
28	36	F	Ph D	Student	Owner	13 years	Life time	4	Tehran
29	42	M	Ph D	Lecturer	Owner	13 years	Life time	4	Tehran

Table 6.1 General description of the respondents (A)

The above table indicates that majority of the respondents are owners and live for more than a decade in their houses, therefore they are familiar with their surroundings. However, a majority of these people either do not wish to live in their present dwellings and prefer to change them or are not happy with the political and economic changes of the Country. This uncertainty illustrates problems which have resulted from the hasty growth supported by the Government, and is one of the thesis concerns.

We can classify people who responded the questionnaire into three groups which have had the experience of three different political and economic eras. The group between 28 to 33 have the experience of living in the Islamic Revolution of Iran, through which the Government aimed to develop the Country by emphasis on an independent economy, indigenous culture and a unique identity. The second group are those ages between 34 to 44 who had the chance to compare this revolutionary period with the Shah's regime⁵ when American policies were dominant and had enormous influence on the Country's plans. The third and the last group is that comprised of people between the ages of 44 to 80, who can compare these two periods with Reza Pahlavi's time⁶. The configuration of the respondents' age, occupation and status are summarized in the three following tables.

Age Group	Male		Female		Altogether	
28 - 33	3	%08.7	3	% 08.7	6	% 17.4
34 - 44	7	% 20.3	6	% 17.4	13	% 37.7
44 - 80	7	% 20.3	3	% 08.7	1	% 29.0
	17	%49.2	12	%24.8	2	%100

Table 6.2 Age of the respondents shows the diversity of the sample (A1).

⁵ In the Shah period, two of the changes that occurred were remarkable. The first was the nationalization of the oil industry and the second was the so-called 'White Revolution of Shah and People', through which Shah changed the agricultural sector to industrialise the Country (see Section 5.1. for more details).

⁶ Reza Pahlavi is the Shah's father, who was sought the growth of the Country under the influence and the support of Britain. His despotic rule was mostly based on progressing infrastructure and transport, with an emphasis on constructing dams and railways. Following the inclination of the previous regime (Qajar) to International and Western cultures, Reza Shah put more emphasis on hasty constructions and the uniformity of culture instead of its identity.

Occupation	Male		Female		Altogether	
Employed	8	% 23.2	6	% 17.4	14	%40.6
Self-business	6	% 17.4	0	0	6	%17.4
Unemployed	3	% 08.7	6	% 17.4	9	% 26.1
	17	%49.2	12	%24.8	29	%100

Table 6.3 Different occupation groups through which 58 percent are employed (A2)

Status	Male		Female		Altogether	
Academic	6	% 17.4	5	% 14.5	11	% 31.9
Literate	9	% 26.1	5	% 14.5	14	% 40.6
Illiterate	2	% 05.8	2	% 05.8	4	% 11.6
	17	%49.2	12	%24.8	29	%100

Table 6.4 Educational status data show that 72.5 percent of the respondents are literate (A3).

The process of reducing material to manageable proportions and abstracting certain types of information from it is fraught with difficulties; the logic of such a process of reduction and abstraction is that it will eventually reach a point where the contexts completely disappear. To avoid this problem, which usually happens while designing a questionnaire or an interview (by accomplishment of a deductive inference), the author's attempt was to categorise the questionnaire from the start of the field-survey's procedure in order to find an appropriate way of interpreting the interpretations of the respondents.

Accordingly, it is worth mentioning that the process of interpretation provides a bridge between the world and people, between their objects and their representations of them, but it is important to remember that interpretation is a 'process', a process that continues evolving as their relation to the world keeps changing. Researchers have to follow that process and acknowledge that there will always be a gap between the things they want to understand and their accounts of what they are like if they are to do genuinely qualitative research. In this regard, the following tables are designed to consider the different concepts and scales, which have been suggested by the thesis, to introduce the process of interpreting the people's

'responses'. This stage has been epitomised as 'classification' in the diagram presented in Figure 6.1. Then, the author has focused on the cluster of 'reasons', related to the 'future plan' which is the third classification of responses in the same diagram, to lead out to the next stage, which is to 'construct' the author's interpretation of the people's interpretation in order to test the model of endogenous development. The following tables illustrate the properties embedded in each question which in turn will help to reveal a classification of the responses.

B House									
No.	Questions (descriptive)	Statistic		Present State		Future Plan			Impact
		yes	no	+	-	Desire	Plan	Change	
3	Do you have a house?	26	3						
4	What is the nature of the ownership ..	*	*						
5	How long have you been in ...	*	*						
6	How long do you expect to stay ...					*	*		
7	Mention 3 reasons for your choose.			*	*		*		
8	Mention 2 important changes ...							*	
9	Mention 3 aspects do not satisfy you.				*				
10	Mention 3 things satisfy you.			*					
12	Have you made any change ...	23	6					*	
13	Mention 2 most preferred things ...					*			
15	Which type of houses do you prefer?	*	*			*			
16	Would you like to design your house?	8	18			*			
17	What is the impact of your house ...								*
18	Is your work far from your house?	14	14						*
19	Are people involved in housing?	29	0				*	*	
20	Can your house resist disasters?	13	16					*	
21	Mention 3 activities during disasters.					*			
22	Mention 3 ways help to have a house	*	*				*		

Table 6.5 Descriptive questions about the respondents' houses (B)

C Quarter									
No.	Questions (descriptive)	Statistic		Present State		Future Plan			Impact
		yes	no	+	-	Desire	Plan	Change	
23	Things you like in neighbourhood ...	*		*					
24	Things you do not like in your ...		*		*				
25	Things you would like to have in ...					*	*		
26	Do you like to be aware of events ...	19	10			*			
27	Do you want to live with your family	25	4			*			*
28	Did you choose your neighbours?	25	4				*		
29	Positive aspect of the past in ...	14	13						*

Table 6.6 Descriptive questions about the quarters where the respondents were living in (C)

D Town									
No.	Questions (descriptive)	Statistic		Present State		Future Plan			Impact
		yes	no	+	-	Desire	Plan	Change	
30	Important buildings in your town ...			*					
31	Buildings you do not like in the town				*				
32	Important areas in your town ...			*					
33	Areas you would like to live ...					*			
34	Areas you do not like to live ...					*			
35	Materials you like to see in the town	*	*	*		*			
36	Materials you do not like to see ...	*	*		*	*			
37	Important features of the past in ...	*	*	*					
38	Events and changes you like to see ...							*	
39	Changes which have been in the town ...	*	*					*	
43	Where do you go for shopping?			*	*				
49	Important cultural / social features ...	*	*	*					

Table 6.7 Descriptive questions about the town(s) of the respondents (D)

E General Aspects									
No.	Questions (explanatory)	Statistic		Present State		Future Plan			Impact
		yes	no	+	-	Desire	Plan	Change	
1	Do you have a house or houses?	26	3						
2	How many people live in the family?	26	3						
11	Have your children secured house?	13	14				*		
14	Is there any possibility for people ...	9	20				*		
40	Dependent growth, imported material					*		*	*
41	Enough local resources for change	11	16				*	*	
42	Important things which give identity			*					
44	Items produced in your community ..			*		*			
45	Items produced somewhere else ...			*		*			
46	Identity of the old part of your town	*	*	*					
47	Two ways of knowing about values ..	*	*				*		
48	Formal education and ...	*	*				*		*
50	Advantages of traditional architecture	*		*					
51	Disadvantages of traditional arch. ...		*		*				
52	Advantages of new architecture ...	*		*					
53	Disadvantages of new architecture ...		*		*				
54	Imposition of external things ...	*	*						*
55	Things which give long term life ...	*	*			*	*		
56	The best way of gathering people ...	*	*				*		

Table 6.8 Explanatory questions about the general aspects of the respondents' lives (E)

Keeping in view the suggested diagram (Figure 6.1) for the interpretation of data, people's responses have been classified into different categories such as 'statistic', 'present state', 'future plan', and 'impact' [see Section (d) in Appendix Two]. The number of questions in each category varies from five to sixteen. Without exception, the responses and their reasons have been recorded in the Appendix concerning the same classification. In order to have ease of analysis and assessment, the data have been compiled and sorted out in ascending order. This

information is seen as helpful for the researcher and other interested parties to use in further research. Only the highest ranked responses (approximately ten in each column) have been included for analysis and interpretation in this stage, i.e. 'classification' (see Figure 6.1).

		Future Plan			
	Present State	Desire	Plan	Change	Impact
38			people's participation in production (+38)		
29			the choice of choosing neighbours (+4, -25)	resistance against disaster (+13, -16)	
27				people have enough resources (+11, -16)	
26	rich zone (+26)				
25	hospital (+21, -4)				
25	Mosque (+25)				
24	neighbours (+17, - 7)	courtyard (+24)			
23	bazaar (+23)		council design (+23)		near work (+23)
21			savings (+21)		
20	infrastructure (+2, -18)				
19	school/college (+19)				far from work (-19)
18	new town (+14, -4)	brick (+12, -6)	bank loans (+18)		dependent growth (-18)
17		present area (+16, -1)			
		helping (+17)			
		N. Tehran (+16, -1)			
16	park (+11, -5)	cooperation (+16)	government aid (+16)		
		people's help (+16)			
		concrete (+4, -12)			
15		S. Tehran (-15)			
14					positive aspects of the past (+14)
13	privacy (+5, -8)			expansion (+13)	
12			mass media (+12)		
11			good location (+11)		
9				green areas (+9)	
8				interior change (+8)	independent growth (+8)
7			local societies (+7)	change of services (-7)	
			parents (+7)	infrastructure (-7)	
				underground (+7)	
				parks (+7)	
5					accessability (+5)

Table 6.9 Presentation of compiled responses which are classified under various concepts. This table includes only the highest ranking aspects of the responses, which are fully recorded in Appendix Two, Section (d).

The above table shows that the most significant responses concerned the 'future plan'. On the left of the table are the number of responses given for each of the aspects or words listed. For example, the words 'rich zone' in the column 'present state' have been used twenty-six times whilst the word 'privacy' has been used thirteen times. Note that the word 'privacy' has been used five times measured positively and eight times measured negatively. A positive measure

indicates a positive use of the word used whilst a negative measure suggests a negative use of that word in the sense of a lack or loss of what is represented by that word. Participation is the highest ranking aspect of list in the table (+38), which is subjective and shows that the people were conscious about their future and considered this to be the principle factor behind productivity and future development. The most negative aspect is the lack of choice and opportunity for choosing neighbours (this was raised 25 times), showing that the respondents felt a difficulty in constructing their neighbourhood, in other words that they felt passive in forming the structure of their communities. Another important aspect raised by the respondents is the factor of change in the harsh and uncomfortable circumstances that they experienced, e.g. lack of security against natural disasters (-16) and the lack of available resources for development (-16).

The column in same table headed 'present state' contains the responses classified under that title. This concept indicates the state in which the respondent existed at the time of the interview or open-ended questionnaire. The second column headed 'desire' indicates aspirations of the respondent, and subsequent columns headed 'plan' and 'change' all show the people's attempts to prescribe or suggest directions for 'future plan'. 'Impact' contains those responses which pursue the relationships between either the component of a system or between two systems.

The author's interpretation of the table is that the concerns of the people followed a loose hierarchy, the most important factors of which are: regard for the built environment, health security, the Mosque as an expression of cultural identity, parks for communal use and so on. People mentioned their relationship and status relative to others in the neighbourhood as a positive factor of their 'present state'. The respondents were conscious of being part of an inherited tradition which gave them their place in the general scheme of life. At the same time, they did not see the need to restrict new development, rather they wanted to incorporate the values they saw in their tradition into those additional resources which are required by population growth. These are positive interpretations but there are also negative concerns which relate to the differences between population growth and the constraints superimposed upon that growth by economic changes. For example, the provision of infrastructure was the

highest negative expression of concern, bringing with it threats to privacy and, as a corollary, an undesirable neighbourhood. This suggests a belief that the provision of designs for new towns and parks by external agencies brings with it unfamiliar environmental phenomena which elicit uncertain responses. However, having completed an overview of Table 6.9, it is now possible to interpret each column and their different concepts separately.

The column headed 'desire' is part of the collective heading for three columns referring to future plan. 'Desire' refers to a wish for some feature or relationship with, for example, traditional configurations of house type or materials and a preference for local government interventions facilitating their life styles. At the same time they recognised the assistance which may be provided by relatives, friends and neighbours. The respondents exhibited a global understanding of their location with relative values based upon their individual knowledge of the whole area rather than merely the street in which they live. The implications of the global knowledge are an awareness of being located poorly in the area and a distrust or dislike of the new materials used to provide the buildings they are in or near to.

The column headed 'plan' contains responses which are interpreted as an overriding concern for the future. Participation within the production of the future was the major concern, although access to experts was considered necessary in order to ascertain the relevant knowledge. Respondents felt that funding for future projects should be provided things realising their savings or unlocking the potential within existing resources, but that bank and thereafter government support should underpin the projected proposed activity. Cultural activities, needed for production, should be reflected in the media but there was a strong feeling that the community itself should provide, through its own productivity for some measure of cultural development. It was felt to be important to have a local organization or even grouping of families in order to make local social interactions possible. The most negative aspect of responses concerning planning was the lack of freedom in selecting neighbours and, through this restriction, a lack of desire to grow long-term bonds of a social nature with those in the immediate vicinity, thus leading to undesirable neighbourhoods.

The column headed 'change' illustrates a great concern about uncertainty, especially where this

is accompanied by a feeling that the respondents are likely to be made more vulnerable by either a lack of provision against natural disaster or a gradual erosion of their capacity to grow and prosper using their own resources. Expansion of their community was regarded positively and valued, and the addition of perceived support to their well being, such as increased planting or an improvement to services was similarly appreciated. When public services are reduced and uncertainty is increased in small ways, such as the perception of unwelcome surroundings, then negative indications were given. Despite their novelty, some new technical or technological phenomenon such as the underground or metro were welcomed for their increase in the provision of public service.

The term 'impact' used to head the last column represents the respondents feelings about the relationship between what can be considered as differing institutions or concepts within the urban context. For example, being near to work was a positive and necessary requirement for the relationship between the home and the workplace, which being far from work had an understandably opposite affect. Considerable concern was directed at retaining many aspects of the past using references located within the existing environment both in physical terms and also through memories relative to social and personal involvement. The ability to grow independently without inhibiting others and retain the ability to move freely around and within the environment was a factor in positive responses. A considerably negative impact was felt according to the amount of externally manufactured goods which became tangibly incorporated into the respondents' lives, as these goods were indications of dependence and reliance upon others.

Finally, Table 6.10 was conducted in this stage ('classification') to show the responses without any division into separate categories so that all the responses were counted as if in one analytical category according to the number of times they were used. Thus, Mosque occurs in responses fifty times as a positive aspect and hospital, for example, occurs twenty seven times positively and four times negatively. These aspects can be used to indicate that certain words are prevalent amongst the responses given but, because the classification is no longer in use in this table, the responses do not appear in context. Thus, it is not possible to interpret a response in the context of a similar relationship between individuals read in conjunction with

a specific time and space, as represented by the temporal classifications with which Table 6.9 is structured. It is felt that the additional information that is made available by presenting this table is the confirmation that temporal classification is a necessary part of the analysis given above.

Present State, Future Plan (Desire, Plan and Change) and Impact		
No.	Positive Responses	Negative Responses
50	Mosque (+50)	
44	people's participation in production (+44)	
41	covered bazaar (+41)	
39		infrastructure (-39)
38	brick (+30)	brick (-8)
36	neighbours (+29)	neighbours (-7)
35	courtyard (+35)	
31	hospital (+27)	hospital (-4)
30	school / college (+30)	
28	near work (+28)	
	cooperation (+28)	

Table 6.10 The compilation of the responses without separation into different time-phases categories

Referring to Figure 6.1, this analysis concludes by moving from an interpretation of the responses on to making use of the 'reasons' given for making the responses. The theoretical position is that the respondents will refer deeply within their own consciousness in order to provide reasons for their statements. The reasons given will thus be less affected by the context of the interview and the concepts are taken to arise from the lives and attitudes of the respondents as justification for statements made. The shift is from anecdotal evidence to a more specific type of evidence which can be used to discuss the findings with other experts or for testing a theory, which is the objective of this thesis. Criteria taken from the model of endogenous development can be applied to the specific evidence such that they may be inducted in order to test the hypothesis and allow the processes of production and experience of the environment to be perceived in such a way that abductive references may be obtained. The references themselves are the various relationships between cause and effect mediated by the production process paradigm contained within the model of endogenous development.

The way in which cause and effect is mediated has been described in Chapter Four as a division into four classifications and these are used as dimensions in Table A.2.15 in Section (f) of Appendix Two, i.e. Theoretical Reflections on Reasons. For ease of reference, these are 'ultimate cause', 'subjective cause', 'objective cause' and 'formal cause'. The entire range of aspects of reasons for responses is analysed under these four headings in order of their frequency (Table 6.11).

Different Dimensions				
No.	Ultimate Causes	Subjective Causes	Objective Causes	Formal Causes
61	helping other people (+37)		climate (+54, -7)	
37				
36				
35	culture (+18, -18)		pollution (-35)	oldness (-34)
35	beauty (+35)			
34				
31	convenience (+30, -1)		economic reasons (-27)	
27				
25	cooperation (+25)		greenery (parks) (+25)	
25	health care (+25)			
25	tranquillity (+25)		cheaper ones (+22)	
25	accessibility (+23)		security (+21)	expansion (-20)
22			noise (-20)	
21				
20				
20	independency (+20)		good services (+16)	historical issues (+18)
18				
17	recreation (+17)			
16	religious duty (+16)			
16	privacy (+15)		their money (+14)	ugly product (-14)
14				
14		no choice (-14)		good location (+13)
14			regularity (+13)	
13		help from experts (+13)		
13	cleanliness (+13)			adaptation (+6, -6)
12				solidity (+12)
12		lack of knowledge (-11)		
11	children's future (+11)		crowd (-11)	weak buildings (-11)
11				
11	traditional identity (+10)			comfortable (+10)
10			local material (+10)	all items (+10)
10			quietness (+10)	
10	well informed (+9)		labour power (+9)	
9				
9		small enough (+9)		
9		my design (+9)		
8		gathering people together (+8)		
8		short distance (+8)		
8		youth training (+8)		
8	changeability (+8)			playground (-7)
8	people's closeness (+8)		shopping (+7)	parties (-7)
7				traffic (-7)
7				residential place (+7)
7			good materials (+7)	shortage of space (-7)
7				
7		nearer (+7)		hard to use (-7)

Table 6.11 The use of different dimensions for further theoretical reflection on the reasons for response to questions from 4 to 56

Table 6.11, includes the most frequent responses under each heading, judged first generally and then separately so that, for example, the first aspect in the column headed 'ultimate causes' was mentioned 37 times whereas the first aspect of subjective causes was mentioned 14 times. In this regard, at a first glance, the table can be seen as a pattern by which the correlational and cross-sectional relationships of the variables are uncovered. For instance, one can interpret from the column 'subjective causes' that the producers and experts of the built environment have less concerns for people in general than any other portion of the productive process; and that the environment and people are areas of the greatest concern in the columns headed 'objective causes' and 'ultimate causes'.

What puts 'objective cause' at the top of the hierarchy, with regard to the ranking order, is widespread concern for the environment. The second major concern is under 'ultimate cause' and is about social aspects created by the interaction of the people as a positive value, as cultural advantages which are hoped for by the people. At the same time, the impacts on culture were expressed eighteen times as a negative factor, indicating a fear that this desire would be frustrated. Pollution was also a cause for concern, obviously a problematic negative aspect as were poor economic resources, both being environmental disadvantages which are exacerbated by such expansion. Hasty growth was seen as a problem because of the uncertainty it brings and the necessary reliance on experts and those who are beyond the immediate experience of many people. Obsolete or redundant products (mentioned 34 times) were a source of concern, which shows the wish to revitalise their future but in a gradual way. The human values of cooperation, awareness, community spirit, etcetera, include suggestions for the experts on how to achieve growth in an acceptable manner such as small scale, dense planning arrangements, accessibility and adaptive approaches.

The above texts were a general interpretation of the range of response aspects across the entire spectrum of the model. But, the specific interpretation of each individual classification is not limited to the top segments of each, since all aspects, even those mentioned only once, have a bearing on the interpretation. In this regard, in the column titled 'ultimate causes' which shows the wants and needs of the people, there seems to be some problems and some suggestions [see Section (f) in Appendix Two for the full list of the reasons]. People referred

to their need for self-esteem and the retrieval or maintenance of principles within their culture such as privacy, identity, unity, social equality and Islamic principles. Some solutions for perceived problems are also suggested by the respondents as those which can only be obtained through social interactions such as the right to being independent, acts of cooperation which do not adversely effects self-reliance and self-sufficiency free from government intervention.

The aspects compiled in the column headed 'subjective causes' are interpreted as showing two main features, the first is with regard to objects whereas the second relates to principles which affect those objects. Despite feeling that there is little or no choice and a need to rely on experts, people do not deny that they do not have sufficient knowledge to act without the active assistance of experts. nevertheless, they wish to achieve a design which is sympathetic to both individuals and the location, and suggest participation several times. They often reiterate their lack of control over the built environment and a wish to cooperate with experts to help the built environment to find a more personal and contextual solution. They see the role of government was similar to that of councils in facilitating people by building their environment and perceive this as governing which is produced to their required ends. They believe that technology and techniques for discipline in controlling the built environment should not prejudice their requirements. They suggest principles for the benefit of the experts either by their prescriptions or predictions such as small scale projects, sustainability, transformation and best use of facilities.

The 'objective causes' is another dimension employed in the third column. The reasons compiled in this part can be classified into natural and artificial, positive and negative, concrete and abstract aspects. The diversity of the reasons reveals the complexity of the relationship of these issues on the ground. Most of the comments relate to artificial resources such as services or heritage, to certainty of cultural values or to poverty (access to funds or denial of access to funds). These are secondary resources, not basic raw materials. A lack of commonsense and clarity of legislation, is also a debilitating factor. Many reasons relate tangible resources and the built environment to higher patterns of thought - theoretical, cultural, political, juridical and ideological. The most significant reasons concerning the environment are almost entirely positive, as are reasons concerning heritage and social ties,

yet the most negative opinions arise from the side-effects of human activity in the environment, such as noise, pollution or crowding.

In the last column, titled 'formal causes', the two highest ranking reasons show dissatisfaction with old buildings and with new activities on the built environment, although people hasten to mention heritage as a positive factor. The respondents often complain about the standard of the built environment as concerns the solidity or spaciousness of buildings. The diversity of the built environment and the range of social activities that can be encapsulated are features of which they are aware. Some respondents pinpointed some principles used in building the environment such as accessibility, multifunctionalism, ease of repair, flexibility, uniqueness or harmony, which are concepts more usually expected among professional architects. Many of these suggest the value of scale, as in the length of the street, the shortage of space and etcetera. The reasons in this column can be also categorised into symbolic principles and instrumental ideas such as durability, utility ease of manufacture, the great majority of which are negative. This can be interpreted to mean that people are generally dissatisfied with the built environment as it stands. The solution in addressing this problem lies in seeking out those positive factors, mainly symbolic principles concerning art, traditional, openness, and establishing from these a more sympathetic brief for intervention within this built environment.

The majority of variables under 'formal causes' are negative, suggesting that people perceive is a genuine problem. By reviewing our staged interpretations of what is unsatisfactory in the artificial domain, it is apparent that it has little bearing on the resources and natural environment but depends almost entirely on the activities of professionals. It is apparat that the problem does not arise from 'objective causes' but by their alteration by experts into finished products. If the problem is not caused by 'objective causes', we then turn to 'subjective causes', where the predominant feeling is the lack of entablement, both in choice and information, for people to participate in developing the built environment, though in table 6.10, in the column headed 'plan', the respondents expressed thirty-eight times the desire to participate on an intellectual level in such decision making. Our reasoning shows that it is the lack of participation that is the single most significant factor in alienating people from their built environment. This knowledge is critical in ensuring that future plans are based

interactively on the input of the people involved. This establishes a strong case for inviting such participation in order to minimise the chances of repeating the errors of the past.

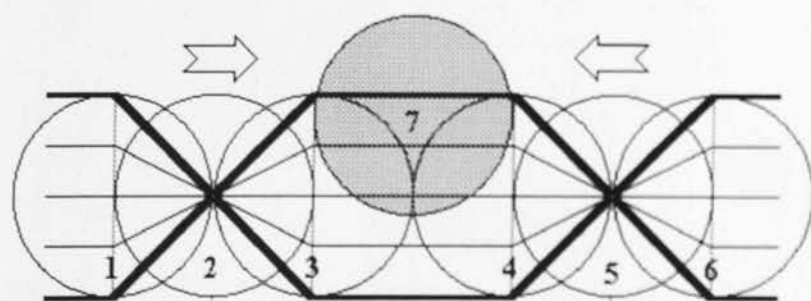
Conclusion of Questionnaire

The selection and interpretation of the data from the responses inevitably reflected some viewpoints more than others, e.g. those of the initial terms of reference. This was made explicit in order to facilitate constructive debate. Accordingly, the survey showed that people are preternaturally interactivist and believe themselves to have the capacity, based on their tacit knowledge, wisdom and cultural desires, to realise future plans which they instinctively feel will sustain their society. This repudiates not so much conducting corrective adjustments to the existing built environment, but establishing a culture in which the people themselves have an active role in determining future developments. In this thesis, the process of feedback, which is accomplished by abductive inference, strongly suggests that the variables listed as 'formal causes' must cyclically educate the professionals responsible for the built environment. This will improve the process of decision making from one that depends upon external assumptions. By induction, the pattern of the people's responses and their reasons directly connect 'formal cause' to 'ultimate cause', which represents not the fabric of the built environment but the values that it should adopt, such as ethical and moral issues, helping other people, beauty and health. The ideas behind this thesis of a model of endogenous development, presented as 'production process' and 'supply-demand' paradigms, were endorsed by the people's wish to have an ongoing say in the processes of knowing and doing which result in the environments in which they will live.

1. The Deductive Approach for Analysing the Literature
2. Quantitative Approach
3. The Abductive Approach
4. The Inductive Approach
5. The Inductive Approach for Evaluating the Hypothesis
6. The Inductive Approach for Evaluating the Hypothesis
7. The Inductive Approach for Evaluating the Hypothesis

CHAPTER SEVEN

DISCUSSION



Deductive Approach for
Analysing the Literature

PART ONE

Abductive Approach for
Synthesising the Achievements
and Modelling the Hypothesis

PART TWO

Inductive Approach for
Evaluating the Hypothesis

PART THREE

7

DISCUSSION

7.1. The Thought Process of the Thesis

7.2. Overview of the Thesis

7.2.1 The Problem

7.3. The Core of the Thesis

7.3.1 Further Observation

7.4. The Implementation of the Idea

7.4.1 Further Research and Recommendations

7.4.2 Final Words

7.1. The Thought Process of The Thesis

In Part One, the focus of the thesis developed from broad philosophical issues which identified the characteristics of 'problem'. Deductive reasoning led the argument through increasingly specialised levels of 'development' and 'participation' towards 'design'. Through this sequence of the magnification of components, global matters could systematically be converged into specific design matters and be understood within the overall framework of what constitutes problems. The case study of Part Three mirrored this process but in reverse. Translating the issue of design into its macroscopic starting point, it developed through inductive reasoning to find that the core of people's perception of a specific design replicated the problems as expressed within global philosophy. Both Part One and Part Three implied a set of principles - the principles extracted from literature and the values expressed through the case study. Recognising the fundamental differences in their sources, one might assume these principles to be incompatible - scientific literature refers to empirical, paradigmatic analysis whereas people only reflect their individual and social value systems and their poetical appreciation of the environment. However, the discovery of this thesis is that these principles proved to be surprisingly parallel. In combination they form the heart of the model of endogenous development (Figure 7.1).

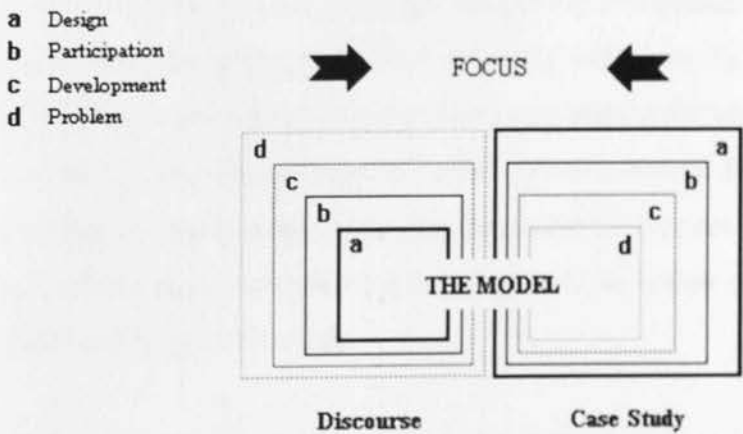


Figure 7.1 The thought process of the thesis

The diagram illustrates how the focus of the thesis is based on two approaches. One leads from 'discourse' on global and practical problems into specific and theoretical design principles using deductive inference. The other discovers specific and practical problems from the global and theoretical design issues in the 'case studies' employing inductive and abductive reasoning.

Source: the author

The thesis, therefore, concentrates the debate around the design process although it relies on far wider themes to establish its reasoning. The potential power of people to create developments that best serve their cultural and economic needs and sustain those values that are most precious to themselves is the concern of the thesis. People are inherently capable of solving design problems, as these are merely problems mediated through a perception of an environmental end-product.

7.2. Overview of the Thesis

This thesis is an attempt to introduce the concept of environmental design through an endogenous model in order to rebuild the relationship between Man and environment. Once ecological principles have been achieved, people will be able to manipulate their designs consciously or otherwise utilizing the schematic images they store of the various components of their own environment.

Design is now more and more associated with manufacturing of ideas and with invention of themes. While it is difficult, if not almost impossible, to distinguish between the Manmade environment and the idea of its design. Building the environment is now predominantly confronted with alien conflicts between materials, structural arrangements and some arguments which claim to underlay its design. Design has lost its essence as a phenomenon whose roots are embedded in history and the relationship with a specific habitat. Any attempt to incorporate values more related to the sophisticated cultural features will inevitably lead to irrelevant and inappropriate designs and plans. **Discrimination between the external influences on the culture and the internal endogenous factors are very important and that is true between universal principle and regional one which can be modulated by the built environment professionals.**

To achieve a greater degree of regional and local self-reliance requires a change in the external relationships and endogenous development clearly has implications at larger scales. The author suggests that restructuring of internal relationships will be only effective if accompanied by changes at the international level. At the national level endogenous development demands a more inward and self-reliant approach and in most cases, at least initially, a degree of spatial

closure from the international system. At present, there are few nations who could not mobilise more of their own human and physical resources, especially if these were used primarily to meet internally generated and established demands rather than the growth criteria of the international system.

Environmental design means many things to many people. One obvious dimension of variation in environmental design and research is scale. Another dimension lies in the design process which has stages. A very preliminary stage requires the determination of the kind of design initiative that should be taken. Research in this instance is often of a structural, economic, or cultural nature. Once priorities are set, the next step in the design process is to identify the needs and behaviours of the eventual users of an environment. The stage of detailed design, where drawings and plans are made, requires knowledge of the effects and implications of previously created spaces or plans. When a design or plan has been created but not yet implemented, the use of feedback control on it from directly and indirectly affected persons is a helpful, often essential corrective step. Public opinion and subjectively deep approaches are often helpful toward that end. Finally, once something has been built or otherwise implemented, it is critical to evaluate how well it works and otherwise succeeds in order to accumulate knowledge about suitable design. More active participation by users can enter at every stage too. Clearly, a large variety of research approaches and methodologies responds to needs for information that vary at different stages of the design process.

7.2.1. The Problem

The nature of endogenous development to society is compatible with a growing trend toward self-government and self-sufficiency in small communities. However, it will not be easy to start up independent initiatives and develop them into a national movement to make such a transformation. Satisfaction with the status quo is too widespread among people not directly affected by development problems. It remains to be seen whether the concept of people's participation can be presented so as to mobilize the public. Full equality of economic opportunity, access to goods and services and participation in the political and cultural life of society are essential requirements of endogenous development. However, it is increasingly accepted that gross inequities between people are not only unjust but represent a squandering

of human resources and a potential brake on socio-economic development. A notable trend of this era, however, has been the widening gap between governor and governed both between and within countries.

As a solution, the built environment professionals have distinguished two main routes of development: one based on the introduction of advanced technologies and concentration on an urban, industrialized core; the other based on maximizing productivity of whatever capital is available, usually beginning with the agriculture sector. The concern of the thesis is that technologies enable humans to expand their range of activities and transform the earth's resources. Technological advances, in principle, enable more productive use of resources, thereby delivering equivalent or improved services while greatly reducing health and environmental burdens. Two long-term trends offer particular hope for mitigation of these adverse impacts: improvements in energy and material efficiency and decarbonization of energy sources. The model of endogenous development has also suggestions for pollution, environmental quality and accumulation of clean technologies which are endogenous.

7.3. The Core of the Thesis

The author has discussed aspects of different world views and philosophies in defining development problems and their solutions, as currently used in different disciplines. The research introduced a discussion of the history of differing values and attitudes presented in management and design. The types of knowledge and some of the values and attitudes needed by built environment professionals were also explored. Some of the proposals addressing endogenous development are discussed in relation to these ideals. The overall approach adopted is that endogenous development is an inclusive concept of which all disciplines practising in the built environment should be aware. The production process is one of the structuring scientific paradigms which forms the basis of the model of endogenous development. According to author's interpretation of development, this model gives us a positive evolution and transformation of the society and increases the quality of life.

Development is about change and there are many forms of change depending on its circumstances. Change depends on the coincidence of the three characteristics of time which

can be evolutionary, chronological or deterministic¹. Evolutionary time is conceptual and imaginative and is the relation of the past to the future². Past and future overlap in the present which, as conceptualised by people, becomes wider than the instant and incorporates some elements of both past and future. Some see the future as starting from the past and the past as a project that is aimed to and will be completed in the future. Many plans have their roots and seeds ambivalently set in the past and in the future.

Endogenous development describes development from within. Developmental changes are either synchronous or diachronous³; they can be subjects or objects. Endogenous change links diachronous to synchronous domain in epistemological terms, cause to effect in philosophical terms. Its progressive stages link the deepest parts of the process to surface structure while operating with each other via 'anticipatory feedback'⁴ control and cyclic mechanisms.

The survey shows that only one half of the cycle - the direct progression from cause to effect - has been considered in implementing development programmes. The completing revolution, which sees the effect transmitted back into the equation as a new cause, was not expressed. This demonstrates a certain fatalism, the inability to reuse the past as a remedy to the future.

The thesis proposes that the process of development has two possible models. One relates to industrial production⁵ and is characterised by feed-forward⁶ control, in other words, control that is dictated by the specialist or producer rather than the participant. The second is natural

¹ Refer to 4.B.2.3. of Chapter Four which is about Cyclic Time and the Process.

² See also Figure 1.A.1 in Chapter One: Section 1.A, Problem Identification, for more clarification.

³ See Chapter Three: Section 3.A.3.1. which is about Synchronous and Diachronous Dimensions.

⁴ Section 4.B.3. of Chapter Four is recommended for more clarification about feedback control. Chapter Four also touches on the role of this concept in the development programmes from a different perspective.

⁵ Refer to Figure 2 in Introduction and Section 1.B.8.1. of Development. You can also find more about Fordism and Tylorism and their role in forming industrialization in Chapter Two: Section 2.A, Design Process.

⁶ See Chapter Three: System View and Structuralism for more clarification about Feedback and Feed-Forward Control which has been discussed in Section 3.B.1.3.1. and 3.B.1.3.2.

and cyclic⁷ and is propagated by feedback and enables those it effects at every level to control the end-product. In the specific example of an environmental development, this permits people to incorporate within it their personal values. They receive the chance to promote their understanding of the artificial and natural domains.

The feedback mechanism can be divided into 'abductive' and 'inductive' control⁸. Inductive control penetrates the inner part of the production process while abductive allows the producers to utilise their knowledge within general policy of design. This places people at the core of the production process, in a 'people-centred' organisation⁹ that allows them to participate at all levels of decision making.

The consequent empowerment of the people creates an evolutionary sense of time which is not possible without feedback. Therefore, participation in endogenous development, from the point of view of the thesis, is critical in setting up this kind of feedback. If people's participation remains limited to lofty political ideologies such as the redistribution of wealth¹⁰, it will forever be meaningless. They must be intrinsically part of the processes of production.

Setting up the feedback mechanism will create a natural process of knowing and doing - and doing and knowing in a cyclical model - from which real, holistic and ongoing development will emerge. The feedback mechanism must always be directed towards the search for ideals, so the ability to perceive these must also be encouraged. Simple survival is not enough to satisfy culture nor be the sole objective of development¹¹. Development is the creation of new things from a stance that respects the past yet strains forward towards new horizons. An

⁷ See Figure 1, in Introduction, and the discussion about Production Process in Chapter Four.

⁸ Refer to Chapter Four: The Model for more details about 'analysis', which involves 'deduction' inference, and 'synthesis', which consists of 'abduction' and 'induction' reasoning. These terms have been discussed in section 4.B.3., which is about Logical Thinking and The Process.

⁹ Refer to Appendix One, Section (p) which is about Good-Centred and People-Centred Organizations.

¹⁰ See Section 2.A.2., i.e. Towards a Definition of People's Participation in Chapter Two. Some reference have been quoted from Moser (1985), Arnstein (1971) and Oakley (1985) about 'distribution'.

¹¹ See Table 1.A.1 and the discussion about four types of managers in Section 1.A.4. of Chapter Four.

interactivist view is critical to this end¹². The cycle operates in the evolution of thought, transforming society yet retaining its identity¹³. It is not so much biological as psychological and social. It needs to have symbolic principals to underpin its ideals, so instrumental principles¹⁴ (utility, durability and manufacturability) are not enough to progress the product.

These cyclical mechanisms are the traditional ways of production. What this thesis commends is not a retreat into reactionary ways, which cling to the objects of the past, but the rediscovery of the lost productive paradigm. Once the product has been actualised into the finished object there follows a new time phase of communication - such as commercial trade. Secondary causes are fed back into the production process through disequilibria created by poorly predicted supply and demand situations¹⁵.

In the process of construction, attention is concentrated around the materiality of the product but during the creative process, it is more defined by the starting points - matters of imagination, of beauty, of values - which revolve around the people and not the product. If people are to participate, they should be accepted within both of these processes. It is typical for people to be employed solely in the service of the thoughts of others - by carrying out building works for example - which can be seen as involvement only in the material phase. This places value on the quality of their work but not on the quality of their lives.

¹² This thesis has placed management attitudes, derived from the philosophy of Ackoff (1974, and 1984), within a holistic conceptual framework. This framework is presented in Chapter One in the form of Table 1.A.1. The table shows the four attitudes applied theoretically to several features of development. The thesis refers to these four attitudes (shown on the left of the table) and the features of development (shown as the headings of the table) as a lexicon of terms throughout its discussion. The table represents a holistic framework of alternative attitudes to management of the cultural system. The system not only contains each individual but is itself contained within the past and the future. This link with time is the most significant aspect of the framework which emerges as conceptually relevant to the four attitudes to management. As managers the 'inactivists' survive in the present, 'reactivists' look to the past, 'preactivists' look to the future. Only 'interactivists' link the past, present and future into a whole system. In mono cultural terms interactivists allow a true evolution of culture, retaining the past, encouraging the future, assessing both of these relative to the present. In managerial terms all four attitudes are present within the population and exert their influences accordingly. Endogenous development is an interactivist approach to managing these influences.

¹³ Some reference have been given in Section 4.B.5. about the mechanism of this cyclic process. The Section System View and Structuralism is also helpful for more clarification.

¹⁴ See Bax's (1989) definition about design process and the author's argument in Section 2.B.7.1.

¹⁵ Refer to Section 4.B.6. of Chapter Four, i.e. Supply-demand Paradigm, for more clarification.

The result of the model is that the participation of people in the diachronous domain would benefit not only them but also the spirit of the development by instilling within it a natural and proactive process rather than an industrial and reactive one.

Each organisation requires a 'body' of individuals and in a natural process this 'body' constitutes everybody and places them and their wants and needs at the core of its attention. 'People-centred' as opposed to 'good-centred' creativity can only flourish in a new kind of organisation based on these lines which not only permits and listens to the values of the people as represented to those in authority but whose fabric is entirely composed of people and thus their ideals¹⁶. Such an organisation is 'lateral' and is concerned with responsibility rather than power and is quite different from centralised, feed-forward organisations. In people-centred organisations the mood is radical as opposed to reformistic (either liberal, reactionary, conservative or a combination of these). The author believes that use of people's participation in both systems is intrinsically capable of improving the quality of life.

Depending on which model is used, the process can be stimulated either by the existence of managerial, decision-making or problem-solving structures or by new circumstances that arise from planning and design matters¹⁷. Changes are the inevitable results of these interactive activities and these bridge the past to the future. The suggestion of this thesis is that all people can participate meaningfully to achieve these ends. There should be no filters that exclude any values held by any individuals, as all are constructive in determining their shared future. The tendency to relate decision criteria to certain identifiable trends within society is inherently one that cannot accommodate and prosper from the collective imagination of people. Papanek's (1984) remark that all people are designers is pertinent in its insistence that every individual, without exception, has the potential to empower and educate the development process¹⁸. If any individuals are neglected, the ability of those who participate in development to enhance culture will be curtailed.

¹⁶ Refer to six types of systems, i.e. state-maintaining, goal-seeking, multi-goal-seeking, purposive, purposeful, and ideal-seeking systems, and their differences in Section 3.B.1.8. in Chapter Three.

¹⁷ See Figure 1.A.1 and the discussion about Problem Solving and Planning in Section 1.A.4. of Chapter One.

¹⁸ Refer to Section 2.B.3., Design for the Real World, for more information about this line of thought.

Every individual, every culture can be conceptualised as a complex system. Philosophy may question, science may discover but every individual must deal with the reality of every day life. People also function as managers whether in their homes, at work or in their thoughts. Endogenous development takes the attitude to management beyond the functional role of employee into the homes and workplaces of the people. It is concerned with more than the 'official managers'. The system itself makes no distinction between one person and another. The distinction is made by the role of the person within each culture. These roles are given functions and the thesis has sought to provide a model of the functions specifically addressing endogenous development.

Alternatives to interactivist management would exploit, repress or suppress change. Functions in alternatives other than endogenous development would make holistic distinctions between 'official managers' and the people. Endogenous development would allow all of the people to develop without excluding the necessary functional distinctions between the role of individuals. Thus, individuals could manage, even no interactivist managers could manage, in the context of the cultural system as a whole.

Even within the 'levels' of the design process¹⁹, people are able to construct conceivable models by applying instinctive 'induction' to interpret plans and communicate to the designer their impressions and emotional evaluations of what is being proposed. By 'abduction', they can translate and correlate between these levels of ordonnance using their knowledge of living in actual space. As the user group, people already form one of the 'domains' of design by virtue of existing within the end-products. This implies a unique knowledge²⁰ which should be invited into the process as a valid contribution towards design evolution. In the phases of the design process, from initial concept to specific product, the input of people's knowledge

¹⁹ For more clarification about design fields, levels and domains refer to Section 2.B.7.1. of Design Process, which is about Different Stages of Design Process, and see also Appendix One: Section (j).

²⁰ The arrival of computer graphics, especially CAD software increased the understanding of building designs which used to be restricted to the relatively few people who could effectively read a set of plans. More and more people can now understand architects designs, and as a result more thought is going into the design before it is turned into reality. CAD software have allowed architects to create 3 dimensional models of their design, which are perceived quickly and easily by ordinary people. In spite the fact that a lot of people believe CAD limits an architect's imagination and creativity, the power of these simulations as a communication device follows the fact that people understand graphical images more readily than other forms of information.

and experience, using 'deductive' inference, should be valued for its instructive significance²¹.

With the inclusion of people in the design process at its every stage - from 'ultimate cause' to 'formal cause'²² - the 'instrumental' and the 'symbolic' principles can be seen to converge rather than conflict. Such process in a people-centred organization is not linear nor driven by a single aim but parallels the process of life and is obedient to natural models where the distinction between 'ultimate', 'subjective', 'objective' and 'formal' causes is seldom separable. This has the potential to change society from being goods-centred and consumerist to value-centred and productive.

It is the belief of the author that the natural processes of an organism are completely different from those of human organisations²³ which pursue intentional changes towards a purposeful and ideal situation. **The only and lonely path for transforming our society and developing it is creativity.** Creativity is a necessary reply to the problems of life and is included in all people. The 'homeostasis' of system view and the 'homeorhesis' of structuralism²⁴ are inadequate for explaining the human intentional processes of production. Because we all live in a conceptual present which is the overlap of both future and past using our memories (schemata, coding systems, models, etc.) and imaginations, we are all creative in one way or another. Culture and civilisation are determined by the promotion of this ability and power²⁵.

²¹ See Figure 6 in Introduction for more clarification. The diagram illustrates different stages of the design process (identification, definition and specification) and the role of people (C) in understanding the appropriateness of the idea seen as a design.

²² Refer to Figure 4.B.5 in Section 4.B.5. of Chapter Four to see the relationship between four stages of the production process paradigm.

²³ For distinguishing the differences between 'organism' and 'organization' refer to Section 3.B.1.8.1., Learning and Adapting in Purposeful Systems, which has been discussed in Chapter Three.

²⁴ Refer to Section 3.B.1.4. for definition of homeostasis and to Section 3.B.2.8. for definition of homeorhesis, which are both in Chapter Three.

²⁵ Culture is the idea and values and civilization is the actually achievement of these values in other means. Civilization relates to certain time and place. It is the type of culture developed by a particular people or epoch. Culture seems to manifest itself in diachronous dimension and civilization in synchronous dimension.

This creativity, or the ability to make cognitive models of complex situations, can be applied in both 'problem solving' and 'design' and is critical for satisfying people's needs and requirements. Any obstacle to the use of this creative power will exhaust the system and lead to tension and, via entropy, to its eventual death. Even if finding the solution to a problem is reactionary, this does nonetheless help to better the environment. Design and development concerns systems which operate beyond purely environmental gestures and material circumstances. The quality of life depends on a more imaginative exploitation of the collective understanding of the future.

It is true that science seeks sameness in general but it is not proper to say that sameness brings science. We should avoid to trace science from ordinary aspects of non-completed daily behaviour of the people. Modernism did so. Those who believed in Modernism tried to unify people by sharing them with lower level of the pyramid of life²⁶. This is not people's desire and will not bring them freedom. They are not simple and simplicity will impose them sameness. They seek freedom through a democratic system in which their creative power manipulate them towards a sophisticated abstract system in the higher level of this pyramid. These unified concepts and ideas will bring them freedom. They can diversify objects freely out of these coherent subjects²⁷.

Nowadays, democracy and liberalism provides access to parts of activities in synchronous dimension, where the thoughts of people are allowed to impinge on the surface level. Genuine democracy, as implied by endogenous development, is not merely the chance to review a finite number of completed options but to be inextricable to the processes in diachronous dimension which arrived at these. The participation of people means an active, living, lateral use of their minds and this alone can sustain endogeny - growth from within²⁸. This is an evolutionary system whose codes are predicated not only by the past but in a state enriched with

²⁶ See the skeleton of science in Figure 3.B.1 for more clarification.

²⁷ It is advisable to remember a Hassan Fathy's (1973) systemic expression of people's participation which indicates that "one man cannot build a house on his own but five men can collectively build five houses for themselves".

²⁸ Refer to the definition about endogenous development cited in the Preface.

expectations of the future and is gathered around the consensus of the values that are shared by a culture. This core of values is not the philosophical preserve of an élite within society, with all other people largely peripheral to their ideals, but is the universal gathering of all individual values. Nor is it permanent. In order to maintain its central values through times of change, the core flourishes and unfolds continually and develops increasingly complex patterns in response to our evolving perceptions of the environment. Such adaptation is crucial to the sustainability of values²⁹, otherwise they become fixed, anomalous and eventually ridiculous.

The enrichment and increasing complexity of the core values is not the main aim of endogenous development but the natural outcome of a healthy 'knowing and doing' society. Endogenous knowledge is about how the natural values and symbols emerge and evolve in a society and how these are valuable and initiate a very decisive and effective force to sustain development programmes, even during the disasters or any tension or exhaust. The correct interpretation of the concept of sustainability must include matters beyond those that refer directly to the environment and include those that meaningfully nurture the values of society.

Where do all of these interpretations leave us in terms of both theory and practice? In the author's view, a real acceptance of new development models is required, allied with the political will to implement them. Development from within is such model. There is, however, a considerable time-lag between the articulation of new models and their acceptance and implementation. Without acceptance of new approaches, the empirical evidence suggests that progress towards improvements in the quality of life for most people in Developing Nations will be slow. Iran's progress will be largely due to the effective political implement action of a new development model. That model is not specific to Iran but, as the case studies supporting the thesis and the discourse suggest, universal. However, the author proposes that the validity of development approaches will not be determined as a result of theoretical and ideological debate but in the realm of practice.

7.3.1. Further Observations

As it was reviewed, the objective of redesigning society should be societal development, not

²⁹ See Section 3.B.1.8.1., i.e. Learning and Adapting in Purposeful Systems, for different kinds of adaptation.

economic growth. A country can develop without growing and it can grow without developing. Economic growth, an increase in the standard of living, should be sought only to the extent that it is compatible with development. Growth should be treated as a means, not an end. In the process of growth, it is difficult to mobilize people against abuses by governments under which they enjoy a relatively high standard of living and quality of life, particularly if they believe both will improve further. It will take a very strong pull to mobilize people to transform their societies so that they can revitalize their economies.

As an alternative solution to the problem of centralised decision making and a media to reach the revolutionary concept that of endogenous development; the thesis also suggests three reformative ways of increasing corporate productivity: (1) using endogenous development; (2) rationalizing corporate processes (using production process paradigm), particularly management systems; and (3) collaboration within and between corporations, government, unions and the public (concerning supply-demand paradigm). Corporations are more likely to pursue people's proposals than are public or private agencies, because people's proposals for corporations are compatible with their self-interests; those for agencies are not. The pressure of competition is often enough to induce corporations to explore new directions. This is not true of private agencies and governments.

7.4. The Implementation of the Idea

The proposal developed in this thesis is directed at society's development, not its economic growth, but it does not preclude the possibility of such growth. The thesis views the reduction of problems more as a way of improving the quality of life than of increasing the standard of living. Quantitative, integrated forecasts regarding the effects of economic growth remain beyond the capacity of current models. The quality of development is as important as quantity; government intervention, the uses of technology and cultural factors play a major role in determining the extent to which growth will generate from within, encourage participation in society and improve the quality of life for the many not the few. While the interaction of such complex factors cannot be precisely modelled, much experience has been gained over recent decades regarding policy approaches favourable to economic growth.

The author's effort to deal with the development problems is a dissolving effort similar to the interactivists orientation about problem solving. **The thesis's suggestion, to professionals in the built environment, is to try to redesign society so as to make the problem disappear.** Their design should be one that is idealized. The author's concern is that idealized designs are not attainable, but they can be approached without limit. More important, when people confront such a design, they generally find that it can be approximated more closely than they had believed before. When those professionals propound their own idealized designs, they cannot avoid recognizing that the principal obstruction between them and where they want to be is 'themselves'. Professionals, in endogenous development, deal with feasibility not when designing but afterwards. The author believes that working backward from where is determined by design to an attainable state yields a more advanced state than working forward from where the real case is situated.

National plans, master plans, structure plans, the plans of cities and all the strategic plans are run by the budget of governments and their policy. The experts use their knowledge which is not indigenous and their organizations are interconnected by international agencies. The judgement of the projects executes in the province where politicians are decision makers. So, what is designed and accepted is not the one people need. They are at last the users of this product but have the right to reject or to accept the plans. It will be too late to consider their needs/wants and the problem is there. In architecture the matter is not as sensitive as the planing. One of the result is that most of the time they serve by the money that comes from the people. To satisfy people needs to work with them and consider their desire.

However, some ways must be found to involve the users in planning and design processes. Is it not conceivable for the individual user to be allowed and even encouraged to be responsible for the design, colour, materials of the external façade of her/his dwelling as well as for the arrangement of the internal partitioning? Planning regulations in many countries do not allow this flexibility. Furthermore, the designer has to reexamine her/his creative process before such an intermediate and continuously changing design solution can be offered. An effective users' involvement can make important contributions to environmental identity. Some basic rethinking on these issues is called for. Users' participation must be encouraged,

designers' image reoriented and planning regulations amended.

The best way for the built environment professionals to become more responsive to people is to participate in design without which people's interests are liable to be distorted or ignored. It is the obvious criticism that these experts cannot be trusted to respond to people's interests unless they do involve them. In another word, they should participate with people.

**"Give a Man a fish and you feed him for a day.
Teach a Man to fish and you feed him for life."**
A Chinese Expression

7.4.1. Further Research and Recommendations

The author hopes that this discussion will be of general interest to architects, urban designers, planners and students in these fields concerned with the theoretical foundations of their discipline, but he has a more directly practical aim as well. He cannot claim to have produced such a theory fully fledged, but he raises what seem to him to be the relevant questions about it, and he explores some of the starting points in a quest for answers.

The model of endogenous development must be seen as a universal concept and the author's attitude towards planning and design, i.e. interactivists orientation, as a prototype specific to Iran. The factors affecting development are specific but the need, even the possibility, to address the factors which influence cultures in general is to some extent useful. The discussion connected to the model should be understood in this context and yet of use to others in identifying the influences at work on cultures in general. Further research is anticipated.

It is time to recommend three factors that are vital for the creation of human environments: first, considering interdisciplinary research into human relationships with the physical environment, and a closer collaboration between the field of psychology, sociology and that of professions in the built environment. Secondly, user participation should be further encouraged: this source of opinion is the case for formulating in detail the human needs that must be expressed in any programme for a site. Thirdly, coordinating the details with the unity, the parts with the whole as the main world view should be the concern of all those

professionals working in built environment disciplines; and such people should be especially trained in this approach to be closer to the core values of the society in transition.

7.4.2. Final Words

Endogenous development seeks equity in economy and equality in society and the need for decentralized government, greater participation in public affairs and less formal organization through an equitable and comprehensive design. Endogenous organization would have a government with no top or bottom, no unidirectional flow of authority from higher to lower. Its government would be characterized by two directional flows back and forth. It would emphasize responsibility rather than authority and service rather than command. Therefore, the thesis represents such an organization as having 'lateral' rather than vertical relationships and people-centred rather than good-centred organization.

The thesis's proposal is only suggestion, not prescription, designed to stimulate the search for and exploration of new ideas. The old ideas, however they may be repackaged, are not revitalizing our societies, improving our quality of life or accelerating national development. It is necessary to design the future people want and invent ways of approximating that future as closely as possible. In this regard, the main contribution of this thesis could be seen in providing a criterion to evaluate people's world views and knowledge of their built environment. It is also providing the researcher himself with the proper approach in his academic career and practical profession as well as for others who have the same interest.

Closing the discussion, the author would like to add that it is certainly people themselves who should decide how to face the environmental problems. The ecological crisis is only an externalisation of an inner malaise and cannot be solved without a spiritual re-awakening of Man. If Man changes, he will be able to bring about change in different aspects of his environment. As such, the principle of change in Man has been the basis of the studies with regard to designing a change in the environment, as is stated in the Holy Quran:

"Allah does not change a people's lot unless they change what is in their hearts."

(13:11)

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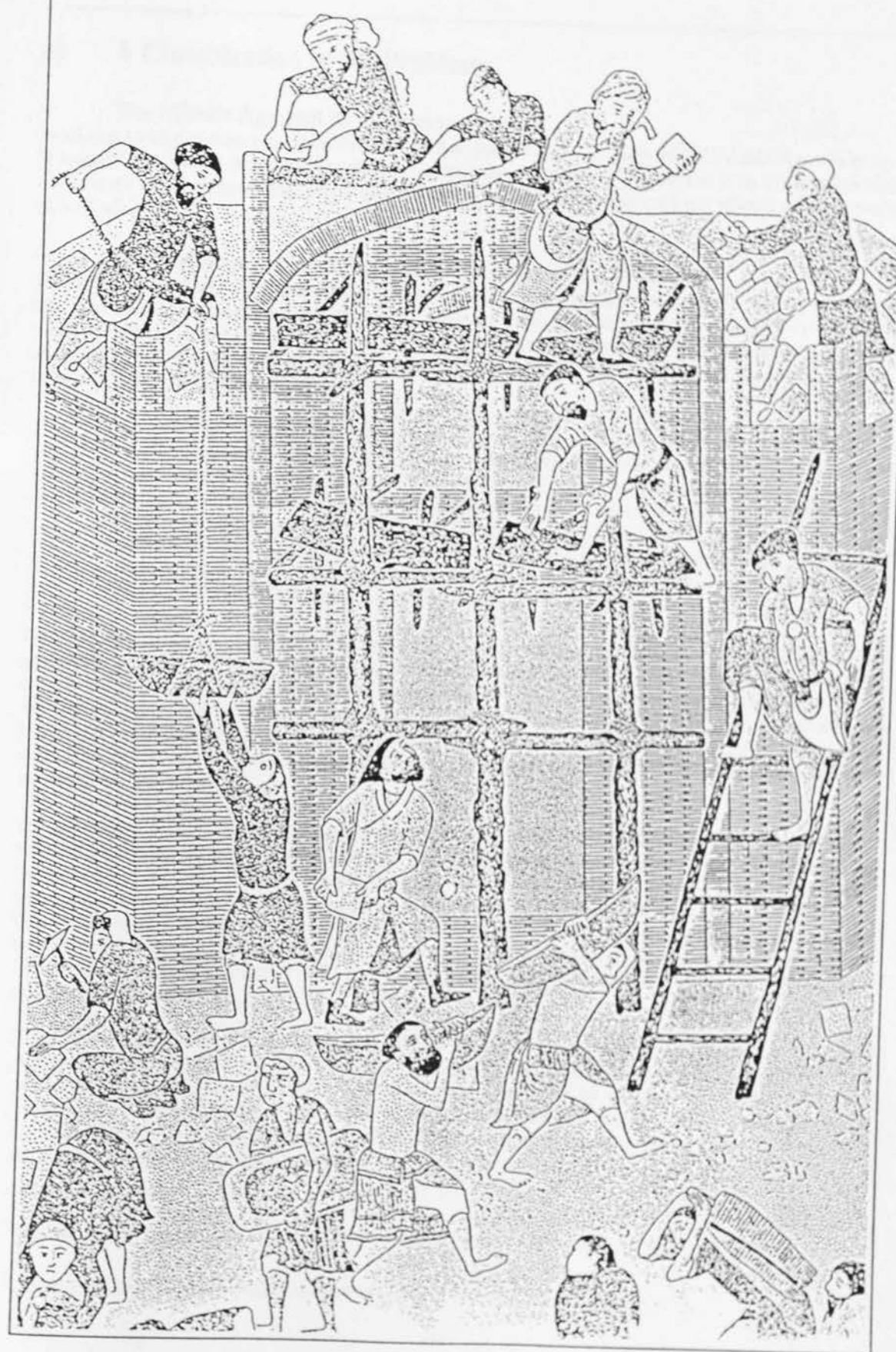
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APPENDIX ONE (Theoretical Aspects)

a) A Classification of the Problems

• The Middle Age and its Problems

In relation to the problems associated with Middle Age, Ackoff (1974, p. 227), writes: "Middle Age was an age of 'inaction'¹. Life was not important enough to do anything about. Death was. No surprise in an age in which Man did not know enough to do anything significant about life. He knew this. He did not know whether or not he could affect death."

• The Machine Age and Reductionistic View of the Problems

The same source criticises the Machine Age and tries to discuss about a specific characteristic of this era by saying that: "the Machine Age was an age of 'preaction'². Man penetrated life with technology, looking for problems to solve, fitting what he found to his solutions: converting windmills to giants to justify use of the weapons in hand, and converting giants to windmills to justify not using his weapons against enemies he feared." He puts forward his discussion in the same page and continues:

"Man learned how to produce, not to consume. He consumed other men and himself. He used himself as a weapon against other men. Death became a way of life. War became a maternity ward in which heroes were born and died. The future happened: it was not made. Destiny was designed by default. Majority races, sexes, and generations - euphemistically called 'minorities' - are rising and demanding a future they can live with now. We mistake our part for the whole; not they. They induce the labour that gives birth to the Systems Age. The Machine Age gave us machines to replace our bodies, and the Systems Age gives us machines to replace our minds, as instruments of work. Will Man have to compete with machines for the right to work? Or is there another whose work he can do? Whose?"

It is also believed by the same author that in the Machine Age messy problematic situations were approached analytically. It means that they were broken down into simpler separate problems that were often believed to be capable of being solved independently of one another. Unsurprisingly, such a procedure not only usually fails to solve the individual problems involved, but often intensify the mess. The solution to a mess can seldom be obtained by solving each problem independently. This appears to be the case, for example, in the current handling of urban mess. Efforts to deal separately with such aspects of urban life as transportation, health, crime, and education seem to worsen the total situation.

The same source writes that analysis was also central to problem solving in a doctrine of reductionism. Problems to be solved were first 'cut down to size', i.e. reduced by analysis to a set of simpler problems. The simpler problems were then solved and their solutions were assembled into a solution of the whole. If the problem to be solved could be reduced to a set of independent subproblems, then the solution to the whole was nothing more than the sum of the solution to its parts. When the whole could not be disassembled into interdependent parts, the relationships between them had to be understood in order to understand the whole. Consistent with reductionism, it was believed that all interactions between objects, events, and their properties could be reduced by analysis to one fundamental relationship, cause-effect.

Beside the previous citations, Ackoff (1974) claims that in the Machine Age problems were thought as 'out there', as purely objective states of affairs. Then he quotes from John Dewey (1930) that decision makers have to extract problems from the situations in which they find themselves. They do so, by analysing the situation. Therefore, problems are products of thought acting on environments; they are elements of problematic situations abstracted from these situations by analysis. What we experience, therefore, are problematic situations, not problems which, like atoms and cells, are conceptual constructs.

¹ See 'Inactivists', a personality type which is described in Chapter One: 1.A.

² See 'Preactivists' who are described in Chapter One: 1.A.

This part is concluded by indicating that those who held the mechanistic view found no need for teleological concepts - functions, goals, purposes, choice, and free will - in explaining natural phenomena. Such concepts were considered to be either meaningless, illusory, or unnecessary in science. Philosophers were left to deal with the dilemmas their exclusion produced. Finally Ackoff (1974, p. 11) points to the notion of industrialization and says:

"The more machines were used as substitutes for men, the more men were made to behave like machines. Mechanization led to dehumanization of man's work. This was the irony of the industrial revolution. It is not surprising that a society that thought of the world as a machine came to think of Man as one also."

• **The Systems Age and Holistic Approach to the Problems**

In Machine Age, the world was viewed as a closed system to be understood through analysis. Therefore, ultimate and final solution to problems were believed to be obtainable. In Systems Age, systems are understood as open and dynamic. Therefore, problems and solutions are conceptualized as snapshots of a moving process. Problems and solutions are in constant flux. Therefore, problems do not stay solved. Moreover, purposeful systems and their environments are constantly changing. So, solutions to problems of these systems become outdated even if the problems to which they are addressed do not. For example, insects develop immunity to pesticides, people to desegregation programmes, and societies to such laws which prohibit the use of alcohol or narcotics (Ackoff, 1974).

Before Systems Age, a complex problem was usually decomposed into simpler problems suitable for different disciplines. Then each discipline would solve its part of problem and these solutions would be assembled into a solution of the whole. But, **contemporary interdisciplines, which is a manifestation of the Systems Age, put a variety of disciplines work together on the problem as a whole.** For example, experts in health, housing, transportation, education, and other aspects of urban life work together on city's problem taken as a whole. It may be added that no problem ever exists in complete isolation. Every problem interacts with other problems and is, therefore, part of a set of interrelated problems, a system of problems, a 'mess'.³ For example, the poverty problem, the urban problem, and the crime problem, are clearly interrelated. Furthermore, solutions to most problems produce other problems. Mess is a system of external conditions that produces dissatisfaction. Ultimately simple problems, like any ultimate elements, are abstract subjective concept and cannot be observed. Therefore, what appears to us as a simple problem is really a 'minimess'.⁴

b) Different Views of Development and Underdevelopment

• **Inactivists' View of Development**

In reviewing their own nation's development, Inactivists overlook its failures and see only its successes, real or imagined. In reviewing underdevelopment of others, they tend to see only their real or imagined failures not their successes. There is persistent suspicion among affluent inactivists that disadvantage people, taken separately or collectively, are innately secondary. Such a belief reinforces another belief of the inactivists: those who deserve get, and those who do not deserve, do not get. Recall that inactivists believe this is the best of possible worlds. Some of them even argue that inequality is god's will. Others maintain that those in Less-developed Countries are at least as happy as we are and, therefore, should be left alone. Facts that contradict this belief are ignored. Inactivists also ignore the fact that development and underdevelopment are interdependent phenomena.

Clarifying this phenomena, Ackoff (1974) says that many Developed Nations are not willing to spend much on assistance to known friends, but they are willing to spend as much as they can to protect themselves against an unknown enemy. They justify doing so in the name of national security and because of its stimulation of the national economy. The irrationality of such spending led Barbara Ward (1968, p. 75) to ask:

³ The word 'mess' is initiated by Ackoff in his book 'Redesigning the Future' written in 1974, page 21 and has been described to be as a system of interrelated problems which are conceptual constructs from complex situations.

⁴ The word 'minimess' is also coined by Ackoff (1974, p. 21) for illustrating ultimately simple problem. Minimesses cannot be observed like the geometric points which are small areas called points.

"Is imagination liberated only when destruction is at issue? Are we to be aroused by our fears and hates and never by our loves? If out of all the carnage were to come some sense of man's unlimited resources for the works of peace, then we could still reap some gain from our harvest of unreason. And one condition of such a hope is to realize that money for tractors stimulates an economy fully as much as money for tanks...."

But, any argument for a more equitable distribution of wealth, including Barbara Ward's, is unconvincing to inactivists who believe that those who have, deserve and those who do not have, do not deserve.

• **Reactivists' View of Development**

The objective of a reactivist's action, is to return to a preferred previous state in which no action was required. This characteristic can be found in his attitude toward so called Underdeveloped Countries. In the reactivist's view the best Poor Country is one that is neither seen nor heard, hence requires no attention. When a Poor Nation acts up and requires attention, the reactivist tries to react in a way that best serves his own purposes. The unmanageable nation's interests are not necessarily ignored but they are subordinated to his. Reinforcing the citation above Ackoff (1974, p. 214) cites an example and says: "the apparent generosity of the United States in the Marshall Plan and in the financial support given to Japan at the end of World War II was primarily motivated by its own national interests. A strong Europe and Japan were believed to be essential to the containment of communism. Had this not been the case, the United States would not have been as generous as it was. This does not deny the presence of goodwill, but it denies that it was sufficient for, or even the prime mover of, its aid programme."

Reactivists occasionally respond to the needs of others out of generosity and concern, but usually only when the event is emergency. They support disaster relief but they do not usually respond to a continuing state of problems such as malnutrition or high mortality. They do respond to a famine, plague, or pestilence in Poor Countries. Once the emergency is over, aid is discontinued. The reactivist's response to the needs of the disadvantaged, Ackoff says, is based on the philosophy of the red cross rather than that of care.

The reactivist's principal argument against foreign aid from political point of view is its failure to buy the loyalty and support of its recipients. For instance, some times the main purpose of foreign aid is to 'buy foreign votes' (see example in p. 215 of the same source). Therefore, if one were to apply this principle to one's private giving, gifts would never be made to anyone who did not support one's politics or religion. In brief, the reactivist does not see the ability to give aid as a benefit to be derived from affluence, but as a cost of maintaining it and, therefore, as something to be minimized.

• **Preactivists' View of Development**

Preactivists propose at least modest increases in foreign aid. Barbara Ward (1968) has made a number of suggestions some of which, she emphasises, require international collaboration but of a type for which there are precedents. These are:

- a) reduce tariffs and other forms of protection applied to products of Less-developed Countries by Developed Countries;
- b) guarantee prices on the products of Less-developed Countries;
- c) provide greater credit to these countries; and
- d) establish common markets.

Beside the increase in aid, Preactivists believe that the knowledge that scientists and technologists in Developed Nations have, would make possible significant acceleration of development of Less-developed Nations. They assert the solution to many development problems are known. Therefore, Underdeveloped Nations ought to turn their development over to the intellectual elite of the developed countries. Preactivists expand this argument and follow two points:

1. additional capital for investment; (which can obviously be generated by increasing the return on those investments that have already been made or are being made. This requires increasing efficiency and reducing waste: increasing productivity of natural resources, machines and plants, and people.) and

2. in some cases the failure to use available technologies effectively is due to lack of adequately trained personnel or to lack of necessary equipment. (But, in many cases technologies that could be used are not. It is obviously necessary for a country that seeks to develop more rapidly than Advanced Countries to exploit available technology at least as well as Advanced Countries do.)

Preactivists realize that technology alone cannot produce development. It must be accompanied by increased productivity of individual workers, whether they operate machines or not. They believe worker productivity tends to lag behind mechanization in Underdeveloped Countries. They claim this is due to the fact that very little use is made of 'soft' technology: industrial engineering, human engineering, and the behavioral sciences. These can be used to redesign tasks for greater productivity or to motivate workers to seek it on their own.

Preactivists argue, we must export management - as well as scientific and technological - skills to these countries. Because, they believe labour-management relations tend to be bad in Underdeveloped Countries and caste often separates manager from worker and prevents his motivating them to greater productivity. In brief, preactivists believe that development of Less-developed Countries is primarily a matter of using what Developed Countries already know and of receiving from them such resources as they can provide without serious modification of their current internal allocation of resources.

To bring an example of finding an ideal solution for the problems of equitable distribution of wealth between the nations, it appears easy to imagine an idealized world in which Underdeveloped Nations would not exist. In light of the discussion of the preactive view of development one would probably start by imagining a centralized world government to which existing nations are related to it. It is said that such a world would eliminate the need for military forces and this, in turn, would make a great deal of money available to the central government for investment in those parts of the world requiring development. Furthermore, this character suggests that essential personnel could be moved about easily and thus located where they are most needed. It also believes that universal compulsory education would eliminate the ignorance that breeds underdevelopment.

• Interactivists' View of Development

To the interactivists, the notion that world government would be enough to assure elimination of inequitable distribution of wealth among its parts appears to be naive. They say how some parts of Developed Nations are Underdeveloped? Ackoff (1974, p. 219) cites another question made by them asking: "How can one explain Appalachia, Puerto Rico, black ghettos, Indian reservations, and migratory communities of Mexican-Americans? In view of what is happening in the United States how can one believe that universal compulsory education is enough to eliminate ignorance in segments of a world federation?"

Prescribing a solution for this kind of discrimination and citing the stimulus of participating people in a national plan for development, the author argues that effective national development requires the kind of individual and collective commitment that is usually brought about by what Ackoff (1974) classifies as:

- a) a perceived external threat from Man (as in war) or from nature (as in the threat of a flood);
- b) reconstruction after Man-made or natural catastrophe (as in reconstruction of Japan after World War II or in repairing the ravages of an earthquake); and
- c) a revolution-leaders of Less-Developed Countries must learn how to bring about such a commitment without the help of a threatened or actual catastrophe, or violent revolution

The consequence of such attitudes mentioned above or a mixture of them manifests itself in several ways, for example, at the end of the Second World War the whole of the African Continent was under colonial rule. Today only a few of its territories remain under such rule. With a few exceptions, all the countries on gaining independence have been following the assumptions handed down to them by their former metropolitan countries. The countries accepted what they were told, that the most effective way of diminishing poverty was to imitate the patterns of development, production, consumption, lifestyles and education of the former metropolitan countries (Fadaka, 1982). The assumption implicit in colonial approach can be briefly stated as a kind of development programme which is also pinpointed by Fadaka such as the following:

- a) an all-out attempt should be made to industrialize;
- b) industrialization is the prerequisite to development;
- c) development should be in the urban areas;
- d) agriculture should be mechanized through capital-intensive farming methods;
- e) economic growth - that is the Gross National Product (GNP) - should be the yardstick for measuring progress; (By shunting more of the gains from economic growth towards the lower income brackets, economic development would be achieved.)
- f) private foreign investments and the transfer of technology from the industrialized countries should be increased;
- g) aid from the industrialized countries should be stepped up; and
- h) exports should be stepped up.

Following the discussion about the preactivists' view and in the same line of thought, the aim of development plans in the colonial period and afterwards was that high priority should be given to formal education to train the high and intermediate labour required for the implementation of development projects (Fadaka, 1982). Therefore, more universities, technical colleges and training institutions should be established, and existing ones expanded to enrol more students. Agreements should be made with foreign countries in well-established institutions.

c) Monopoly and Bureaucracy

• Monopoly

An organization is a monopoly if it has exclusive control of or a right to control some commodities or services. Many government service agencies are monopolies. As Savas (1982, p. 20) noted: **"Lacking competitors, a monopoly agency is inexorably driven to exercise its power and exploit its monolithically secure position."** [the author believes that the same reason may be found in the case study] Henderson (1982, p. 11) elaborated upon this allegation: "The unlimited power of government overrides the constraints of cost, value, efficiency and productivity imposed by the marketplace. Consequently, **the services provided by a government tend to be far more costly** than those subject to the freedom and natural selectivity of the marketplace⁵."

Talking about the reliability of monopolising the services, Henderson (1978, p. 124) argues: "Citizens now wonder if they can be relied upon to deliver uninterrupted electricity and all the consumers durable on which we have become hooked, with adequate safety and reliability, at prices we can afford and with tolerate levels of population and disruption of other community values." It is said that the apparent lack of concern with public safety in the construction and operation of atomic energy plants has seriously undermined the public's faith in monopolistic utilities and government's ability to regulate them effectively. Ackoff (1974) says, oligopoly: market control in the hands of a few providers is not much better than those situations. Muller (1980, pp. 61-62) conducts the same idea:

"They all must administer prices because they have similar problems and advantages. Their flexibility is limited by the very bigness of their projects and sales and by the long lead time required to put their products on the markets. They all face similar wage demands. ... If one were to lower its prices, the others would follow and none would gain. If one raised its prices ahead of the others, its share of the market would fall dramatically. ... Administered pricing is a logical consequence."

• Bureaucracy

The same source indicates that a bureaucracy is an organization that is designed to operate as much like a machine as possible because its designers believe that machines are efficient, easy to control, and hard to destroy. In his classical treatment of bureaucracy, Max Weber (1978, pp. 987-989) observed: "Once fully established, bureaucracy is among those social structures which are hardest to destroy.... The ruled, for their part, cannot dispense with or replace the bureaucratic apparatus once it exists, for its rests upon expert training, a functional specialization of work, and an attitude set on habitual virtuosity in the mastery of single yet methodically integrated functions...."

⁵ Although its cost depends on the freedom and natural selectivity of the marketplace when the concern is given to the end-products and supply-demand paradigm, but there is a need for considering the matter of productivity as the main factor of production process paradigm [see Chapter Four, The Model (4.B)].

It is said that such an apparatus makes 'revolution' in the sense of forceful creation of entirely new formations of authority, more and more impossible technically, because of its control over the modern means of communication and also because of its increasingly rationalized inner structure.

A bureaucracy places more value on its own survival and stability than on performing its function satisfactorily. Government bureaucracies are able to survive despite their inefficient delivery of services because they are subsidized and the size of their subsidies does not depend on their performance. Rather, their survival depends on their size and ability to serve the political purposes of the people or the agencies who provide their subsidies. According to Niskanen (1971, pp. 8-11) budget maximization is the driving force behind government bureaucracies. For them, growth is survival insurance.

The operations of an ideal bureaucracy never vary and are independent of the environment. As Weber (1978, p. 988) observed: "The professional bureaucrat is chained to his activity in his entire economic and ideological existence. In the great majority of cases he is only a small cog in the ceaselessly moving mechanism which prescribes to him an essentially fixed routine of march." Therefore, as long as a bureaucracy's subsidy does not vary, neither will the quality nor the quantity of its output. **Increased productivity is not, as it was said, one of its objectives.** Consequently, **managers of bureaucracies focus on inputs rather than outputs; inputs are easier to measure and control.** They assume that the control of costs is equivalent to the control of performance. Morison (1966, p. 64) pinpoints this fact that because bureaucracies induce machinelike behaviour in their members, they suppress people's need to express themselves as purposeful individuals, and writes:

"Though Man is rational, he is also biological and emotional. He proceeds not only by his wits but by his instinct, his intuition, and his feelings. And though he is political and social, he is also a single person and idiosyncratic. He has peculiar personal needs and fears and desires, and retains a sense of himself alone. Though he has an urge for order and safety, he also persists in inconsistency and the disorderly and even dangerous conduct out of which come many of the truly imaginative and original works of Man. Within the bureaucratic system is a spirit antagonistic to this part of Man. It is this, I think, that produces the bitter and sardonic tones that so often appear when people speak of bureaucratic action." [the author's emphasis]

As a result, employees of bureaucracies become inflexible and indifferent to those they serve. This is crucial in some places like Iran when more emphasis is given to the academic record of a person than the other factors in his or her Curriculum Vitae which may help reducing these differences and inflexibility. Bureaucracies affect the performance of an organization as a whole as well as the individuals within. Morison (1966, p. 64) describes the implication of the ideas in a bureaucratic system and says:

"Some thing happens to a plan of action or a programme when you enclose it in an institute, or in this case, in a bureau. It tends to lose its freshness, its responsiveness, within the hard and rigid lines of the institution. Those at work on the programme tend to get caught in complicated struggles for power and place within the structure and may forget the purpose for which they exist Any institution, any department, any bureau that gets lost in its own concerns loses its awareness and responsiveness to the outside situations it is supposed to deal with." [the author's emphasis]

Bureaucracies resist adaptation and, therefore, can operate efficiently only in static environments (Ackoff et al., 1984). Today in Developing and Underdeveloped Countries, however, because their environments are increasingly changing, they are less and less able to perform acceptably. When their survival is threatened, they usually demand even stricter-than-usual adherence to their rules and regulations, both internally and externally. This further reduces their efficiency, effectiveness, and concern for the people they are supposed to serve in the process of different development programmes and their implementations.

d) Basic Approaches to Development Programmes

• Rural Development

It seems necessary to review the definitions, approaches and scale of practice of rural development. This would help the later discussion, with the possibility of incorporating development objectives in harsh situation either economic, social and political or the situations after disasters (manmade or natural), when the acceleration of development is

necessary and the lonely way for people is usually to rely upon their indigenous organizations.

The definition of rural development is described by World Bank (1975, p. 3) as: **"a strategy designed to improve the economic and social life of a specific group of people - the rural poor."** The same report also indicates that 80% of the poor population of Developing Countries is rural. It also mentions that the objectives of the rural development, therefore, extend beyond any particular sector. They encompass improved productivity, increased employment and thus higher income for target groups, as well as minimum acceptable levels of food, shelter, education and health.

Classifying different approaches in rural development, Zargar (1988a, p. 249) refers to Postchi (1986, pp. 5-6) who divides these approaches into two groups of 'extended' and 'integrated'. Zargar also pinpoints the World Bank classification that categorizes these approaches as following:

- a) "the minimum package approach;
- b) the comprehensive approach; and
- c) sector and other special programmes."

In the discourse about development, rural development is also equated with rural economic growth and improvement in agricultural productivity. But, there are empirical evidences showing that increasing agricultural output alone, with the belief that this would raise rural incomes and have significant multiplier effects, is not sufficient to generate rural development (Adesanya, 1994). According to the World Development Report⁶ of 1992, 'development' is about improving the Well-being of people, raising living standards, improving education and health as well as providing equality of opportunity to all human beings. Broader developmental goals also include guaranteed political and rights as well as social justice for all. Later the same source propounds the reason of concern about agricultural production and writes that agriculture still provides the means of livelihood for more than 80 per cent of Developing Countries' rural population. This dependence on agriculture has actually contributed to the shaping of government policies on the development of rural areas. Thus, until recently, **'agriculture-oriented'** approaches to rural development were also adopted by many Developing Countries.

Adesanya (1994) mentioning the failure of 'green revolution' technology that relates to 1960s and started in many Developing Countries, states that agriculture-oriented approaches are not capable of generating rural development as had earlier been thought. He mentions that after the failure of this approach other rural development policies and strategies have been put forward. **Basic need approach; rural industrial development approach; rural labour development approach;** (which encourages the provision of non-farm employment opportunities) and **the building of social and economic infrastructure;** (with the ultimate aim of using them to develop both physical and human resources), are some of them which are also pointed out by Sharma (1980, pp. 2-9).

Zargar (1988a, p. 249) believes in the failure of the rural development programmes and claims that for a long time this practice which only focuses on some aspects of rural life, agriculture for example, have been obviously doomed to failure. He discusses that change and improvement in other aspects of poor communities, such as organisation and even culture is also necessary. He states that **'integrated rural development'** is a manifestation of this idea. The model of endogenous development, which will be discussed later in Chapter Four, supports this idea and looks forward to see the hidden scientific principles which cause this integration. Lea and Chadhri (1983, pp. 12-13) in relation to this claim state:

"Thus, the phrase 'integrated rural development' was coined for those situations where planning objectives had some or all of the following interrelated attributes in common:

- a) to improve the living standard or 'well being' of the mass of the people by ensuring that they have security and that their basic needs such as food, shelter, clothing and employment are met;
- b) to make rural areas more productive and less vulnerable to natural hazards, poverty and exploitation and

⁶ World Developing Report 1992, "Development and Environment", in Oxford University Press, New York, 1992, p. 34.

to give them a mutually beneficial relationship with other parts of regional, national and international economy;

- c) **to ensure that any development is self sustaining and involves the mass of the people (this involves among other things encouraging self-reliance and public participation in planning); and**
- d) **to ensure as much local authority and as little disruption to traditional customs as possible. The former means promoting administrative decentralisation and political self government.** [the emphasis here is given by the author to the organizations and structures of the societies which makes the other objectives of the list more applicable]

Following the trend of the rural development strategies, Chadhuri (1983, pp.19-20) emphasises on the importance of the implicit or explicit ideological orientation behind them and classifies the following basic elements which are widely occurring dissimilar in different strategies:

- a) land policy;
- b) technology policy;
- c) employment policy;
- d) education, research and extension policy;
- e) rural institutions policy;
- f) price policy; and
- g) linkage with the rest of economy.

Another suggestion for rural development is **the reorganisation of administrative boundaries** to enhance the closeness between local governments and the people at the grassroots, and the creation of rural growth centres. None the less, many of these strategies adopt a sectoral approach to rural development. In this regard, Adesanya (1994) confirms that the development policy is now seeking multi-sectoral or the **Integrated Rural Development (IRD) strategy**. Smith (1992) mentions different interpretations of this approach. These range from integrated rural and national development, integrated rural and urban development to the integration of development within specific areas. There are also different versions of the IRD programmes, all of which are and alleviate rural poverty through a package of interlinked services which are simultaneously provided (Adesanya, 1994).

Non-Governmental Organizations (NGOs) approach, in the promotion and execution of rural development programmes, is also one of the issues in many Third World Countries. Some of these countries, respectively are helping in the mobilisation of development grants for the training of rural community development agency staff and other people within rural areas (Human Development Report, 1991)⁷.

Adesanya (1994, p. 147) argues that because many "Developing Countries cannot afford the huge material, human and financial resources required for serious and genuine rural development projects, the slow but a gradual shift towards a more balanced policy of spatial integration and development offers better prospects for more rural development programmes and activities in the future." Beside this suggestion he mentions two reasons to justify his idea and writes that first, for any meaningful recovery rural areas have to be brought into mainstream economic recovery and secondly, that many rural communities have realised that they cannot and should probably not expect their respective governments to meet all their basic needs. The same source pinpoints several cases that self-support communities emerged and allowed more communities to participate, sometimes directly in rural planning and development programmes. For instance, in Zimbabwe, the Village Development Committees (VIDCO) have applied the 'bottom-up' approach to development which is a switch to 'top-down' or the 'trickle-down' strategies (see also Higgins et al., 1993, pp. 19-30).

An example indicates that availability of funds, although essential, does not necessarily has the most significant role in the development of the community, Zargar (1988a, p. 258) refers to an example to address insufficiency of the indicators of development and states:

⁷ Human Development Report, 1991, Oxford University Press, New York, 1991.

"A glance at the World Development Report indicated that the wealthiest nations of our world are the 'high-income oil exporters' such as Kuwait and Saudi Arabia, whose 'GNP' per capita is much higher than the United States. Still by any definition of development, there is evidence that in terms of many indicators applied to measure their degree of development, such as life expectancy, the illiteracy rate and infant mortality, they must be counted among the Developing Countries."

According to most Developed Countries' experience, as it was also reviewed, the process of modernization is in fact a process of transformation from a traditional agricultural society to a modern industrial society. In a rural area, this change mainly refers to an increasing number of rural people leaving agriculture for other types of employment, mostly in industries. However, for most Developing Countries, modernisation is indeed a dilemma facing the governments as the urban areas are incapable of absorbing a massive number of rural migrants while in the rural areas the land simply does not need many of these people. Therefore, how to properly accommodate the rural 'surplus' is practically another issue for the modernization of most Third World Countries as it is even for the Developed Countries.

There is a growing realisation about the implementation of the development theories. Many believe, as the author does, that **the proposals for actual practices in rural areas should be simple and understandable to encourage people's participation and to guarantee the continuity of those programmes.** Fadaka's (1982) prescriptions or suggestions are worthwhile of mentioning as examples of some actual practices in rural areas which have been introduced in this chapter as followings.

• Self-Help Village

The need for new forms of farming organizations, that would overcome the powerlessness of the individual farmer and his family, has been suggested in several rural development documents. Individual villages or combinations of villages are also discussed to be the basic form of organizations through which the rural transformation can take place. **Communalism or holistic approach towards organising the societies' affairs is also called to be the basis of the traditions in Third World Countries:** it has fundamental philosophical implications (see Chapter Four). Therefore, these villages can be run on communal lines and all work in them done communally.

As a solution for some of the rural development problems the thesis supports this idea that cooperative and self-help villages can, as far as possible and practicable, be based on the different ethnic or national groups, and the economic activities in the villages or sets of villages can be widened to include poultry, fishing, vegetable production and the keeping of livestock. Agricultural practice, therefore, will be based on labour-intensive farming methods. When not working on the land during slack periods, farmers could be engaged in rural public-works projects, such as building roads or their own dams for irrigation systems with the help of agricultural instructors, agronomists, etc.

The villagers can build their own workshops and cooperative shops, grain mills, timber mills, etc. Cash crops can also be grown communally. Credit and marketing lend themselves readily to the cooperative approach and members can learn the value of cooperative activity, and more particularly the ability to improve quality of production will become better understood. In this regards, all rural developments can be internally financed as much as possible.

• External Aids

The thesis supports the idea that Third World Countries are not as poor as most people would have them to believe, nor is their need for aid as great as it is made out to be. Many of the countries possess everything they need - space, resources, agricultural potential, people. They lack only certain skills and capital for development which can be acquired, otherwise they have enough cultural resources needed for the qualification of their lives. With rational use and management of their resources, the countries can be self-sufficient in many sectors of their economies with minimum dependence on foreign aid or trade.

Some experts in development believe that external assistance, which can be useful in helping Third World Countries, acquire the skills that will allow them to undertake their development. Such assistance should not dictate or untimely influence the resulting choices which will determine the course of development. The choices can only be made by the people concerned. In this regard, the author suggests that technical and financial assistance from outside should be provided in forms and under conditions which support the achievement of locally selected approaches to development which has, of course a certain characteristic that will be addressed in Chapter Four.

All too often the reverse has been the case, in that development patterns have been determined largely in response to external initiative and the biases of externally provided capital and technical assistance.

• **Small-Scale Agriculture**

Fadaka (1982) suggests that in order to increase agricultural productivity to meet the needs of an expanding population, a complete restructuring of the rural societies through land reform is essential. Land reform could take several forms depending on the conditions in the various countries. As the family is an economic as well as a social unit, therefore what any land reform may aim to achieve is suggested by the same source to be the ownership of a small piece of land which should be given to each family, so that it can invest whatever funds it has for raising yields and improving the land.

• **Small-Scale Industries**

The main branches of industry in the villages are those clearly depend on agriculture, such as the preservation of animal foodstuffs, the manufacture and repair of agricultural tools, brickmaking, etc. Small-scale and cottage industries for the preservation and processing of meat, fish poultry and agricultural products and residues such as fats, carbohydrates, proteins, cellulose, pulp and leaf, to replace many imported foods and goods, can be set up in those villages. Furthermore, livestock, poultry, eggs and milk could produce materials for small industries. Therefore, these industries are almost traditional and labour-intensive (Ibid.).

As far as the thesis concerns, the villagers will need technology to achieve their development goals, a technology that is consistent with the maintenance of a healthy self-reliance, self-supporting, self-regulating and self-financing human-scale society at village or community level. It has usually low impact on the ecosystem and will enhance rather than disrupt the life of rural communities. Therefore, it is suitable for application on a small scale and can be cheap and available to everyone in the village rather than a privileged few. It can be designed in such a way as to provide villagers with the means of doing profitable and intrinsically significant work; of helping them to achieve independence from bosses so that they become their own employers or members of self-governing cooperative groups working for subsistence and local markets. Therefore, it will be labour-intensive, and capable of being reproduced locally, thereby encouraging indigenous industries.

A new type of literature should be created for the rural population - literature on ecologically based low-impact technology for support of small-scale village communities. Such literature may contain information on low-cost building materials, low-cost dams, low-cost energy (e.g. wind, water, solar, biogas and other renewable energy uses), low-cost medicine, low-cost transport, labour-intensive models, workshop technology and all those things the village needs to be self-sufficient, self-reliant and largely self-governing (Fadaka, 1982).

• **Low-Cost Medicine**

Another example is worth mentioning to envisage the improvement of public health. For instance, many proposals in rural development area state that the villagers need to build their own dispensaries, community health centres and nursery schools with the help of trained doctors and nurses with midwife training. Villagers ought to be trained in basic social and preventive medicine used for the conditions and diseases in their areas, and trained in first aid so that they can treat simple disease individually.

Small clinic for maternal and child health, family planning and health education can be set up. In these proposals, priority is given to the training of medical auxiliaries what the Chinese call 'barefoot' doctors. Traditional medicine is also included in public health policies in these suggestions. Traditional healers are trained and form the core of primary health workers for nine-tenths of the rural population of Underdeveloped Countries, and they are usually consulted by the people instead of other health workers. Traditional medicine's merits in the light of modern medicine are also explored, and efforts are made to promote the integration of valuable knowledge and skills found in traditional medicine into modern medicine.

• **Decentralized Education**

Grounding the proposals about development described above will need a new form of education, education which is decentralized. It has been said that the first aim of education is to help people integrate with their environment. The concentration of resources in the urban areas at the expenses of the rural areas increases the difficulties. This in turn creates a large group of schooled people with academic qualifications which are internationally acceptable

in the most intellectual subjects but bear little or no relevance to indigenous needs. So, that is why there are thousands of unemployed school-leaver roaming the street looking for jobs that do not exist, especially in Third World Countries. The author would like to support the idea which has been cited by those commentators who claim that with the centralization of education, universities and schools would be in compatibility with the people they have to serve. Therefore, they subjects of study should be about the specific needs of the community in order to reduce the impact of general or 'bookish' education.

The author argues that schools should be integrated with society, and not separate from them. They should not give people false hopes. The importance of examinations is observed as downgraded and a spirit of cooperation rather than competition. There should be no separation of manual work from learning, nor of practice from theory. Therefore, the educational system should include a sense of commitment to the total community. There is abundant evidence suggesting good examples of education for self-reliance villages one of which is Fadaka's (1982) examples about 'part-work, part-study' in Cuba and the 'work and study' programmes in Tanzania and in China.

An emphasis on the social orientation of education is made in the above proposal. For example, it concerns that educational policies which aim to conserve, as far as possible, all the sound elements in the fabric of social life and social structure. The basis of family, kinship, sex, age-group, workplace and neighbourhood will form the basis of social education and community welfare in this suggestion. It is also necessary to mention that unless education in Third World Countries can keep these bonds strong, it cannot be expected to mould the people in a way that will enable them to integrate with their communities. the thesis agrees with those who believe that **if people are to drive any benefit from their education, their training should aim at strengthening the basic relationship which form the foundations of social morality and civic responsibility** [this has been examined in Chapter Four].

• The Impact of Mass Media on Rural Development

The last point which has been cited by Fadaka (1983) as a proposal for rural development is the role of mass media and the ways that they are treated and controlled. The thesis's concern is also about this fact that mass media can play a very important role in the process of transformation if they are flexible and can respond quickly to the real and different needs of the people in different parts of a country. They can be used to carry out literacy training and campaigns. They can be also used to introduce new ideas, attitudes, skills and knowledge into rural communities. But, the author would like to argue that their functions are limited in producing information, not programmes and/or instructions which are vital for structuring the structure of the societies. This may also be achieved by each individual participating in the development programmes to achieve knowledge and experience.

The mass media can and does affect expectations. They can be used to help change of attitudes. Great care should be taken not to increase the aspirations and expectations of the population more than it is feasible to satisfy in the short and long run. This would require a very careful control both of the mass media and the formal school system. The mass media - radio, television, newspapers, magazines, books, cinemas, theatres, tape recorders, all objects of communication - also play a part. They, which reform an informal educational role parallel to that performed by formal education, are organized and operated by educated people living in the urban areas. Thus, most content and programming reflect a modern-sector bias.

Fadaka (1983) claims that the mass media also helps to widen the gap between rich and poor by drawing attention to the conspicuous consumption of many Third World elites, in an attempt to enhance their status. This helps reinforce the desire for a lifestyle out of reach of the vast majority of the population. As the gap between expectations and the reality of most of the people widens, more people find no legal ways of satisfying their desire, and thus either become disillusioned and frustrated or turn to crime and corruption. However, it is conceivable to mention that these key components which collectively define the discourse of development will be reexamined in the application of the model of endogenous development that the thesis has introduced. The following discussion will trace the application of the above general theories by propounding more tangible and grounded examples.

e) Hasty Development in Harsh Situations

The discussion on development indicates that the concept of development is perceived variously by different people and agencies and is usually simplified by the interveners of a region. If the aim of development programmes is to address the roots of underdevelopment and they are defined as 'a shift in the existing situation', for example, of disaster stricken communities such as reorganizing land ownership and employment, the interveners are invariably

not able to take any significant steps. But, this may bring opportunities for the indigenous actors to play their role in formulating their objectives of the development programmes. The author would like to specify some of these environments which may help finding some indicators of development plans for Iran, the case study, where harsh situations (disasters and wars) occur from time to time and the interveners usually prepare ad-hoc plans which are incapable of solving the actual problems permanently.

For example, there is a debate about using the opportunity for change after disasters in reconstruction discourse. Zargar (1988a, p. 272) says that he examined the validity of the assumption that after a disaster a 'unique opportunity' to introduce change exists. In fact, this has been a basic factor governing the conduct of development programmes after disasters. Then in his conclusion of his thesis, he also claims that "in reality such an opportunity is only perceived by parties other than the survivors and both theoretical analysis and empirical findings proved that this assumption was false." But as he argues, the relationship between the parties and survivors is more related to the kinds of development strategy than the existence of opportunity for it. Showing the indicators of development, the author would like to exaggerate the situation in which the interveners usually rely on the immediate action and seek short term solution instead of long term plans. For example, reconstruction after war is one of these occasions which is introduced in the following text.

• Development and Reconstruction after War

Following the discussion about indigenous development, the aim of this section is to illustrate the potentiality of this kind of development in solving those problems which need special treatment. The literature about disasters suggests that little can be done to mitigate the loss of human life and property in disasters especially in a war situation. In war time, evacuation, shelter construction, keeping a distance from more vulnerable targets such as barracks, factories, ... and dispersal were identified as major approaches. Therefore, one step is to sketch out the implication of the 'survivor strategy' about settlement reconstruction, in harsh situation after disaster. It has been pointed out, by the literature about reconstruction, that there must be the maximum use of local materials, and the involvement of the people. On the other hand, there must be the minimum interference with the pre-disaster norms and standards, coupled with as little delay as possible in carrying out a speedy rehabilitation.

It is also argued that a new and, therefore, 'strange' environment can become an additional stress factor, retarding their mental recovery. So, the study of the psychological recovery of disaster victims supported the idea of rebuilding the 'familiar' pre-disaster environment. Another major finding, which has been referred to, is that the active participation of disaster victims in all stages of rehabilitation can be a positive factor in their psychological recovery (Zargar et al., 1988c). The same source indicates that an 'unfamiliar' settlement could only become another burden disrupting the social and economic life of the disaster-stricken community. It observed that particularly in the reconstructed villages of Khuzestan⁸, the traditional life often continues in the modern settlements, in the view of their inhabitants, was in those cases where the design of the buildings, site layout and so on were decided by the villagers themselves or were similar to the traditional forms. In the page 728 of his thesis Zargar (1988a) writes: "The best results were to be obtained when the inhabitants expressed their ideas and needs and more important decide upon and became directly involved in implementing the reconstruction projects." This is another evidence supporting the author's concern about people's participation in decision making process which can be one of the thesis's recommendations in development in general and will be examined in Chapter Four.

Davis (1978, p. 63) also bases his argument on some assumptions that include; first, reconstruction time, especially of poor families houses using indigenous materials, is much faster than the time required to construct a house in a developed country. He says: "... in a poor country house building is very rapid, and can be thought of in terms of days, whilst in the 'developed' world it is a matter of month." Second bases of his argument is: **"Another myth that colours our thinking is to imagine housing as a static, complete entity, when in actual fact it is always evolutionary."** [This is also the author's emphasis which will be examined in Chapter Two: Design process (2.B) and Chapter Four: The Model (4.B).]

Concluding the discussion about development in harsh situation the author would like to refer to another evidence cited by Abedini Rad (1983, p. 62). He reports from the D'uhe Region earthquake in Iran about a new approach

⁸ An Iranian Province located in the south west of the country which faced many destructions and damages in Iran and Iraq war (1979-1987).

he tried for construction of earthquake of resistant houses, based on training the local inhabitants and improving traditional methods of construction. However, he also points to the fact of the unaffected communities' participation and the significant role they played in the relief period.

f) An Idealized Design for a Participative Democracy

There is a citation from Ackoff et al. (1984) which suggests that a participative democracy would have a government with no top or bottom, no unidirectional flow of authority from higher to lower. Its government would be characterized by two directional flows back and forth, similar to the thesis's proposal for the model of endogenous development theory. Therefore, it has been employed to emphasize on **responsibility rather than authority and service rather than command**. Therefore, such an organization is presented as having lateral rather than vertical relationships.

In a participative democracy, suggested by the same source, the governed would be self-governing to the extent they wanted, and they would have direct control over any other government they created. They would be the ultimate source of the power and the resources available for collective use. The basic unit of government would be small enough to be governed by all its adult members - **a committee of the whole, an assembly that reaches decisions by consensus**. According to the proposal, the basic units should contain no more than about 100 adults, for example, a city block or a small village.

Each basic unit would elect a leader from among its members. The leaders of about ten contiguous basic units would form the next unit of government. These once-removed units would be accountable and responsible to their constituent basic units. Leaders of the once-removed units would in turn form twice-removed units, which would be accountable and responsible to their constituent units. This process would continue until a national unit is formed. The leader of every unit would be elected by the members of that unit (Figure A.1.1).

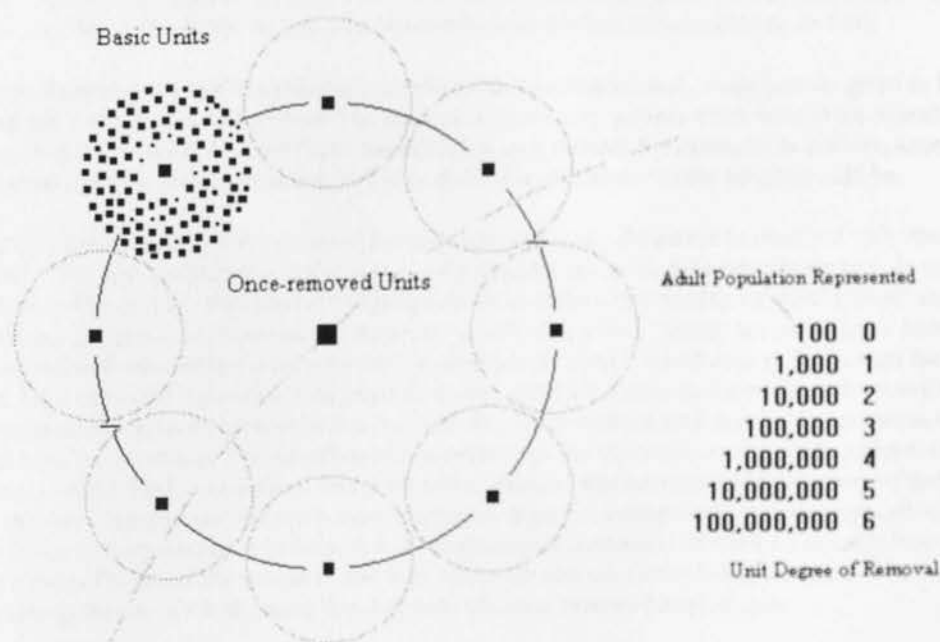


Figure A.1.1 Vertical and lateral relationships between the units of a participative organization (derived from Ackoff et al., 1984)

Source: The author

The leader of every derivative unit would be expected to participate in meetings of its constituent unit. Therefore, all leaders of derivative units except the national leader would participate in their respective constituent units and the larger unit of which these is a constituent. Then all unit leaders, but those of the basic and once-removed units

and the two most removed, would interact directly with leaders of five different units: two more removed, two less removed, and their own. Such interaction would facilitate their tasks of (vertically) coordinating and (horizontally) integrating the actions of different units which is the significant point, as the thesis is concerned, that can help justifying the ways by which a lateral organization needed for an endogenous development programme is possible and the methodologies by which one can interpret the existing indigenous organisations.

If basic units contain about 100 adults, and once-removed units are formed by bringing about ten basic units together, and so on, the number of people represented by each unit of the resulting society would be somewhat as is shown in Figure A.1.1. These numbers are not fixed. Several considerations would affect the actual number and size of units. For example, if states or cities are retained as political units, different ones would have different numbers of units. If, for example, fifty states were retained in the design, the leaders of these states could constitute a national assembly, congress, or parliament. One or two members of each state unit could also serve in a second house of congress. Many other variations are possible.

Basic units could do whatever they wanted provides that their actions had no effect on any other basic unit. Any actions that could affect other basic units would require the approval of the units affected or, if they did not approve, of the closest unit of government responsible to all the basic units affected. Derivative units would be able to do anything they are empowered to do by their constituent units as long as their actions did not affect units outside their jurisdictions or other units at same level. All power would flow from the basic units; all responsibility would flow to them. No one would be compelled to participate in the governance of her/his basic unit. Participation would be voluntary, but anyone who did not participate would, nevertheless, be bound by the collective decisions made.

All money accumulated by any level of government in excess of its budgeted operating costs would be allocated on a per capita basis to the basic units to which it is responsible unless the basic units decide otherwise. Budgets of all derivative units would require approval by their constituency units. Units could pool their resources to provide or obtain jointly desired services or facilities, such as trash collection, road maintenance, or police and fire protection. No unit of government would be able to charge taxes on less-removed units or individuals without their approval. Any unit could derive income from the provision of services if the conditions set forth.

The national government in this participative democracy would have only those powers given to it by less-removed units of government. It would be likely to receive such powers when economies of scale applied or where there was a need for centralized coordination and control, for example, in defense, immigration, and aviation control. Whatever could be better done at a unit closer to the people would be.

Ackoff et al. (1984) claim that this design of participative democracy should not be confused with other kinds of democracy. They say, the federal governments usually delegate power to units subordinate to it. In this regard, Miller et al. (1983, p. 154) state that shift of programmes to states is "the transfer of pseudopower" and without resources not much can be achieved. To empower people, they claim, "should not be mainly a policy of less resources but one of more choices in the ways that resources can be used." Ackoff et al. (1984) accept that this idea is correct, but it misses the main point. They pinpoint the fact that even if resources are moved down to lower-level units of government along with authority and responsibility, these units depend on a level of government 'further' removed from the governed. The allocation of resources from the top-down is what made corruption in many democratic systems. They also mention that government officials, who are responsible to others further removed from the governed than they are, are much more tempted to engage in corruption than those responsible to people who are closer to the governed. The basic unit in a participative democracy of this kind can also be expected to monitor closely the use of the resources that they ultimately control. Derivative units can also be expected to monitor closely the use of the resources that they have allocated to more-removed units.

The same source suggests that the participative democracy described here would demonopolize and debureaucratize government. It can also be approximated in some neighbourhood associations, cooperatives, professional societies, and trade associations. In trade⁹ associations, for example, corporate members are the source of funds, and each is normally represented on the governing board. The association has no power over his members; it is their servant,

⁹ Trade is attributed to Supply-demand relationship and resource is attributed to Production Process, two paradigms related to the model of endogenous development theory. (see Chapter Four: Section 4.B)

doing only what is asked to do. In brief, it serves the common interests of the members without reducing their autonomy. Members are free to leave the association for another whenever they so desire. There is also an increasing number of examples in which small communities with participative governments provide themselves with better services at a lower cost than big governments provide.

• Towards an Idealized Participation

The public has been activated in the names of many causes that captured its imagination and channelled its (often latent and unconscious) desires. But, can the idea of a participation by itself mobilize people to participate in a social movement directed at its realization? Richard Louv (1984, pp. 130-133) points out some successful social development:

"In a single decade, a whole new level of democratic self-rule has arisen: Tens of thousands of private minigovernments, called community associations, are controlling common-interest communities. For the first time, local government faces a private government competitor in the delivery of public service. ... The range of goods and services bought by these associations is impressive. Fancy electronic surveillance systems, telephone-answering services, private police, central utilities, and homeowners' insurance are all purchased with the leverage of group buying power. ... As a result, the cost of such coverage is often reduced by as much as 60 percent. Some community associations are even buying group vacations and communal computers." (See Section 2.B about design process and the role of the consumers in it.)

The public appears to be ripe for mobilization. It has been viewing with increasing alarm the rapidly rising cost and power of government, the loss by individuals of self-determination and self-sufficiency, and the abuse of consumers by public and private providers of goods and services (Ackoff et al., 1984). The author would like to argue that there is also a growing sense of powerlessness among people who depend on government for essential services and the condition of their environment. They find government service agencies unresponsive and often abusive. The governed resent being treated like undeserving subjects or supplicants. It is not that they want more care and attention from government - they want to be less dependent on it. They want to control more of their own lives.

The growing consumerist movement in many More Development Countries, might be redirected to focus on services rather than goods. The average consumer is spending more on services than on goods, but consumer's supports continue to focus on products. To the extent that the issues such as 'expensive government', 'expansive government', and 'abuse of service consumers' can be brought into sharp focus, public pressure can be built against hierarchically structured, bureaucratic, monopolistic government and for people's participation (Ibid.). There are also some suggestions for effectiveness of governmental efforts. As a result, several proposals have been made for revitalization of the society and its economy some of which have been suggested by Ackoff et al. (1984):

- 1) dialogue;
- 2) change of policy;
- 3) socioeconomic reform; and
- 4) a radical transformation of society.

Regarding the last part of these proposals, some people such as Henderson (1978) argue for radical social change. She advocates pushing government down to small primary communities and replacing economic growth with improved quality of life as a social objective. She argues that only through networks of small, self governing units the economic problems can be solved without degrading the environment. She also proposes several inventions for the central government, including resources conservation programmes; policies to foster the conversion to low-capital-investment and labour-intensive industries; and strong antitrust measures. But, the author would like to stress that she does not deal with the apparent contradiction between stronger centralized control and decentralized communal self-government. Nor does she bring her many proposals together into a cohesive, consistent redesign of society. Therefore, the thesis's concern is that **radical social change should be both structural and functional and it must have the effect of returning government to the people. But, there is also a need for knowing that such changes have little chance of being brought about unless a comprehensive redesign of society is presented. Even with such a design that task is formidable; without it the task is impossible.**

g) Consumer-led Design

Is it morally acceptable to maintain a system in which, as Page (1990, p. 59) puts it, "advertising and, more importantly perhaps, the desire to mass-manipulate people for financial gain has become perfectly acceptable, and in many ways downright desirable?" The thesis would argue that consumer-led design not only manipulates people and makes them dissatisfied, but encourages them to be excessively materialistic as well. Life becomes a matter of what people consume, and more public and selfless values are diminished in importance. So, it is conceivable to find out that the needs of individuals and social groups who have little power in the marketplace are simply ignored.

Concluding the attempt to identify the term consumer-led design, it is worth saying that its effect on people is a matter of controversy. Since mass production began in the nineteenth century in the West, design moralists have warned of the dangers of materialism and selfishness. Against a background of this situation, which is still one of the real problems, the cultural critic Hoggart (1957, p. 340) attacked the American mass media and said: "... progress is conceived as a seeking of material possessions ... and freedom as the ground for endless irresponsible pleasure."

In this regard, the author would like to appreciate Whiteley's (1993) suggestion which indicates that market(ing) segmentation is not synonymous with social pluralism. **People have power in the marketplace only if they have sufficient money; many groups in society have a minimal income and so are excluded from the marketplace.** Therefore, consumer-led design does not - and cannot - deal with the needs of these people because there is no profit in them. In indigenous societies, there exists a harmonious, socially plural and tolerant society whose structures are effectively catering for the sick, the homeless, the unemployed and the other disadvantaged. In the same line of thought, a number of feminists also argue ... that marketing-led design is inadequate for many women. It seems to work best for the affluent, white, male - and probably childless - middle classes.

• Want Products versus Need Products

Bringing an example from Britain to explain the designers' attitudes in the consumerist society, Whiteley (1993) mentions that design as lifestyle is demonstrated by the arrival of the style-conscious Habitat stores; the first was opened in 1964, during the era in which Britain evolved from being a 'consumer' to a 'consumerist' society. Terence Conran (1987, p. 27) recalls that "There was a strange moment around the mid-60s when people stopped needing and need changed to want ... Designers became more important in producing 'want' products rather than 'need' products, because you have to create desire."

Campbell (1987, p. 60) identifies 'longing' as the characteristic cultural condition of consumer society. Longing is manifested in daydreaming, advertising, marketing, the design of products people buy and the places people both purchase and consume them. The same source underlines the importance of understanding the difference between concepts of 'need and satisfaction' on the one hand, and those of 'desire and pleasure' - which give rise to longing - on the other. It writes: "The former relate to a state of being and its disturbance, followed by action to restore the original equilibrium." Needs is, therefore, essentially a state of deprivation: the need for food arises from hunger.¹⁰ The same source writes:

"By contrast, pleasure is not a state of being so much as a quality of experience. Not properly itself a type of sensation, pleasure is a term used to identify our favourable reaction to certain patterns of sensation. Desire is the term used to refer to a motivational disposition to experience such patterns."

For Campbell, a fundamental difference between 'need and satisfaction' and 'desire and pleasure' is that **needs relate to a state of being, while pleasure relates to a quality of experience** and, "although interrelated these cannot be directly equated."¹¹ Campbell's thesis is that the shift from a concern with needs to one which focuses on pleasure is the effect of not only affluence and abundance, but also of the Romantic emphasis on the nature of individual experience and sensations, and of industrialization (Whiteley, 1993). The spirit of the modern consumer is, posits

¹⁰ Because of the importance of the matter 'need' in the model of endogenous development, it has been also discussed in Chapter Four: Section 4.B (The Model), precisely.

¹¹ The same source, page 61.

Campbell (1987, p. 37), "an apparently endless pursuit of wants; the most characteristic feature of modern consumption being this instability." The modern consumer has to realize that her/his wants will never be satisfied "because of the apparently endless process of replacement which ensures that when one want is fulfilled, several more usually pop up to take its place."¹² This is different to an addiction which has a sharply defined single focus, such as the physical addiction to alcohol or drugs. By contrast, Campbell (1987, p. 37) says that the modern consumer:

"... is characterized by an instability which arises out of a basic inexhaustibility of wants themselves, which forever arise, phoenix-like, from the ashes of their predecessors. Hence, no sooner is one satisfied than another is waiting in line clamouring to be satisfied; when this one is attended to, a third appears, then subsequently a fourth, and so on, apparently without end. The process is ceaseless and unbroken; rarely can an inhabitant of modern society, no matter how privileged or wealthy, declare that there is nothing that they want."

As soon as a want is fulfilled, it seems to die or become obsolete. Campbell (1987, p. 86) goes to say that "the desiring mode constitutes a state of enjoyable discomfort, and that wanting rather than having is the main focus of pleasure-seeking." He has described accurately and well the consumer's frequent mood of longing in today's consumerist society.

• Local Traditions and Global Conditions

Following the discussion about need and satisfaction from one side and desire and pleasure from the other side, the real needs, Levitt's (1960, p. 45) suggested, were at point-of-sale, repair and maintenance. His thesis was to place the consumer centrally in the company's thinking. This might involve the company completely redefining how it thought of itself. Levitt (1986, p. 25) awaits the collapse of the multinational corporation that "knows a lot about a great many countries, and congenially adapts itself to their supposed differences" to be replaced by a "global corporation" that "knows one great thing about all countries, and lures them to its custom by capitalizing on the one great thing they all have in common." Local traditions and customs are replaced by a global condition in which, for example, pizzas, Chinese food, Coca Cola, etc., become a language as universal.

Some commentators see in globalization, a threat of anonymous standardization; like an international hotel chain, the globalized product would deny national variety and cultural difference. Other argue that the basic product may be global but that the producer will have to take account of national and regional taste cultures, if it is going to satisfy its geographical market. For instance, Whiteley (1993) argues that Philips and Braun became the leading suppliers of electric shavers in Japan only after reducing their size to fit smaller Asian hands. Marketing, he says, may have to vary considerably from country to country, depending on cultural habits and expectations. The relation between marketing and cultural expectation can be defined by exploring the relation between supply-demand and production process, two paradigms of endogenous development model which will be examined in Chapter Four.

Whatever the product, it is certain that marketing will play a crucial role in the consumer-led design products, and that marketing will help to position a product in a cultural or market place. It has become standard practice to differentiate consumers by lifestyle rather than socio-economic factors. The same source suggests that people can all be fitted into one of four main lifestyle categories:

1. **'traditionalists' or 'mainstreamers'**: (those who seek the predictable and reliable)
2. **'achievers'**: (those with wealth and the desire to surround themselves with objects which reflect their status)
3. **'aspirers'**: (consumers who are highly status conscious and who seek the latest fashionable products) and
4. **'reformers'**: (consumers with a conscience who buy recycled paper products)

In this suggestion, the categories are not discrete and a consumer may inhabit one lifestyle in some purchases, and another one because of environmental or health factors: for instance, ozone-friendly products are now being bought by 'mainstreamers' as well as 'reformers'. Nevertheless, the categories are useful enough to form a broad 'lifestyle'

¹² Campbell, Colin, 1987, *The Romantic Ethic and the Spirit of Modern Consumerism*, Oxford, p. 37.

approach to marketing. A target group within the category then has to be identified by the producer. He quotes from a market-research company who identified 'avant guardians', 'pointificators', 'chameleons', 'self-admirers', 'self-exploiters', 'token triers', 'sleepwalkers', 'passive endurers', 'Lady Righteous', 'hopeful seekers', 'lively ladies', 'new unromantics', 'lack-a-daisy', 'blinkered', and 'downtrodden' as useful subgroups of those categories.

• The Modernist Design Versus Green Design

Concluding the arguments about the role of design in society, it is worthwhile to have a brief look at the debate that exists between Modernist Design and Green Design. Representing Modernists attitude, Anni Albers¹³ (1924) wrote: "We all have the same telephone without longing for an individual design. We wear similar clothes and are satisfied with a small degree of difference within this restriction." She wrote in the same statement: "The good object can offer only one unambiguous solution: the type."

Albers's sentiments help to define the opposite to a design which is consumer-or market-led. Describing the notions of choice and variety in the design and styling of products, Whiteley (1993, p. 8) states, were considered unnecessary, outdated and socially divisive by those committed to the Modernist vision of technological progressivism. He says:

"Choice and variety were unnecessary because Modernists would be inventing the type-form - the perfect or, at least, optimum solution to a functional problem - for every product; they were outdated because unnecessary diversity and profusion were characteristics of the Victorian Age of pompous individualism with its 'romantic gloss and wasteful frivolity'¹⁴. They were also outdated because the new spirit of progressivism called for egalitarian collectivism, and each product would thus be available to all. There was no longer any need for choice and variety in product design because science, technology and the dynamics of the 20th century condition would provide people with choice and variety in their daily lives."

Walter Gropius (1926), the director of the Bauhaus rallied designers for "the creation of type-forms for all practical commodities of everyday use".¹⁵ Thus, the search for the type-form became, in the words of one Modernist writer, Richards (1935, p. 137), "the paramount task of the modern designer". A type-form would remain unchanged unless or until new materials or new processes of manufacture could improve it. Albers believed that the design of telephones had, in the mid-1920s, arrived at their type-form: had become standardized, simple, mass-produced and - in keeping with the new age - impersonal (Whiteley, 1993).

Marcel Breuer (1927) expanded on the idea of impersonality in design. In language that was as precise and unemotional as the objects he designed, Breuer called for "clear and logical forms, based on rational principles".¹⁶ The 'logic' of the forms would be determined from the object's primary function and ergonomic requirements. The primary function of a teapot, for example, is to hold tea satisfactorily; and its ergonomic considerations include a spout which pours rather than gushes or dribbles, and a handle which is comfortable to hold. 'Rational principles' would include such supposedly timeless dicta as '**economy of means**', '**truth to materials**', '**integrity of surface**' and '**a resolute affirmation of the living environment of machines and vehicles**'.¹⁷ Breuer (1928) described

¹³ She was at the time of writing a student at the Bauhaus and she went on to become a weaver of international repute, extolling the Modernist virtues of the Bauhaus through her books on weaving, her teaching in Europe and the USA; her textile and fabric designs (Whiteley, 1993).

¹⁴ Walter Gropius, 1926, "Principles of Bauhaus Production" in Ulrich Conrads, ed., *Programmes and Manifestos on Twentieth Century Architecture*, London, 1970, p. 95.

¹⁵ Conrads, Ulrich, Ed., 1970, *Programmes and Manifestos on Twentieth Century Architecture*, London, p. 96.

¹⁶ Tim and Benton with Sharp, eds, 1980, *Form and Function*, London, p. 226.

¹⁷ Gropius, in Conrads Conrads, Ulrich, Ed., 1970, *Programmes and Manifestos on Twentieth Century Architecture*, London, p. 95.

Modernist Design as 'styleless', for it is expected not to express any particular styling beyond its purpose and the construction necessary therefore.¹⁸

For Breuer and other Modernists, it was not just each object that should appear impersonal, standardized and styleless, but the total environment in which they were contained, even if it was a house or an apartment. For example, the same source writes: "The new living space should not be a self-portrait of the architect, nor should it immediately convey the individual personality of its occupant." The idea that a living space ought not to reflect or express the personality, taste or aspirations of its occupant is, by today's consumerist norms and expectations, a denial of the very function of design.

Illustrating the rigidity of the Modernist's rationality, Whiteley (1993, p. 10) claims: "Modernist approach to design in the 1920s and 1930s reveals the total absence of consideration for the consumer about the consumer's tastes or desires." Many commentators convey the fact that Modernist designers rejected any notion of design being dictated by 'the market' as a debasement of standards. According to their beliefs, the consumers had a responsibility to improve their tastes and to live up to the progressive, unsentimental and rational design solutions and type-forms that resulted from the 'systematic practical and theoretical research in the formal, technical and economic' aspect of an object; these aspects were themselves underpinned by what Breuer (1928, p. 95) said: "the resolute consideration of modern production methods, constructions, and materials."

Bringing more evidence to illustrate the logic of Modernist Design, the author would like to quote from Sheldon et al., (1936, p. 54) who suggested 'progressive waste'¹⁹ or 'creative waste' in defending American economic system. They employed not only economic but also cultural defence for this system, which is well-known in using the Modernist's aspects, and said: ".... In America today we believe that our progress and our chances of better living are in positive earning rather in negative saving." Therefore, more production in affluence will cover the expenses of the wastes which are in the progress as the system itself is.

With this line of thinking, the major problem for manufacturers and designers of today seems to be essentially no different from that described by J. Gordon Lippincott (1947, pp.12-13). The major problem, he wrote, was of continually "**stimulating the urge to buy**" now that the market was becoming saturated. He said that the new situation was arising because of "entering a period of accepting an economy of abundance rather than an economy of scarcity". He justified high consumption in a way which became standard in a market economy and said: "Any method that can motivate the flow of merchandise to new buyers will create jobs and work for industry, and hence national prosperity Our custom of trading in our automobiles every year, of having a new refrigerator, vacuum cleaner or electric iron every three or four years is economically sound."

The logic of Modernist Design, therefore, was 'standardization, simplicity and impersonality': a minimalist aesthetic of 'less is more'. Yet, the author accepts this idea that Modernist and Green Design, which is introduced in the following Section (h), are essentially at odds. It is also said that Modernist designers sought simple and standardized products not only because of their belief that such forms in themselves signified reason over emotion, order over chaos, and even the triumph of man's will over nature. In their unambiguous commitment to industrialism, Modernists wanted their designs to express the Machine Age (see also the Machine Age in this Appendix) through a 'machine aesthetic' that was underpinned by an ideology of scientific rationalism. Green Designers reject industrialism and the old 'Man'-centred scientific rationalism as a cause of the ecological imbalance that has resulted from an attitude of 'conquering' nature and exploiting resources. Whiteley (1993, p. 90) pinpoints to this fact and says: "Not only do Greens replace 'Man' by 'human', but they seek to rebuild the whole idealist pyramid that presented 'homo sapiens' as the apex of an increasingly progressive and cultivated civilization." He believes that 'homo sapiens' can no longer be set apart from nature, but must be seen as an integral part of an ecological system.

One line of Green Design is said to be craft-oriented, and its proponents champion aesthetico-moral principles that

¹⁸ 50 Years Bauhaus, exhibition catalogue: Royal Academy of Arts, London, 1968, p. 109.

¹⁹ The role of the waste in production process has been discussed in Introduction of the thesis and Chapter Four, The Model (4.B).

derive from the design reformers of the nineteenth century: Pugin, Ruskin, Owen Jones and William Morris (Whiteley, 1993). These modern designers uphold aesthetico-moral principles such as 'truth to materials', and try to bring out the unique quality of that material; they also subscribe to guiding principles such as Pugin's "decorate construction but never construct decoration". Ruskin believed that all art and design should be based on the study of nature which, for him, was nothing less than God's handiwork. Many Greens share an celebratory attitude to nature, and this often finds its way into design.

To show the differences between the two attitudes, Cavanagh (1988, p. 26) compares new shopping centres with "older town centres [which] offer communities amenities such as clinics, dentists, libraries, etc., which do not only focus on consuming." He also claims that they offer more opportunities for informal social meetings and are usually more accessible by public transport or on foot from residential districts than the new shopping developments which tend to favour the more affluent car-owning shoppers.

h) Green Design

Environmental issues are no longer the speciality of the scientific experts: in the recent decades, they have come to the forefront in a great many everyday considerations, from the contents of packs of detergent to the type of energy needed to power consumer goods. Public alarm about ecological threats such as greenhouse gases and the destruction of rainforests has alerted manufacturers to an increasing demand for 'environment-friendly' goods. This new level of public awareness has caught many designers by surprise. Everywhere, they are being asked by manufacturers to make ecological considerations an integral part of the whole design process (Whiteley, 1993). But, what exactly are the issues, and is it possible for designers to produce 'green' products?

Green Design as an idea sets out to fulfill this need. It defines the issues clearly, and addresses the problems designers may encounter in architecture and interior design; product design; packaging; print and graphics, and textiles. An environmental approach in the whole design-to-production cycle means that decisions must be made about choice of materials; minimisation of resources; type of energy source; industrial treatments; the length of life for products and how to dispose of them when they are no longer of use. Through the following passages, an attempt has been made to explain how enormous improvements can be made in the use of materials without sacrificing good aesthetics or excellent functioning. In the next part of the thesis, the author will discuss about the main objective of development programmes through which design will be more concerned with society's ultimate desire and needs and will maintain its cultural transformation as an end.

Green Design questions are guided by the far more crucial matter of the planet's resources and ecological well-being. Just as questions of 'function' or 'style' are part of every design problem, 'Green' factors are and should be an integral part. Nevertheless, this is still in the area of instrumental principle and there is still a need for considering the role of symbolic principle in the design processes. **It is also characteristic of Green matters that any particular aspect relates to a greater and interconnected whole. The micro is directly related to the macro, whether about resources, pollution or human conditions. For example, Green politics have shown us that design is not a simple matter of personal choice and preference, but a complex issue with interlocking human, political and environmental dimensions.** Against this complexity, marketing-led design looks increasingly shallow and irresponsible (Ibid.).

The same source describes the emergence of the first ecological movement, following the political unrest and social upheavals of the late 1960s across Europe and the United States, as if it was in part a reaction to the values of ecological progressivism that were prevalent in the 1960s (**in which bigger or faster was always better**); and in part a rejection of the consumerist attitudes that promoted a 'you are what you consume' mentality. The literature about design signifies Carson's (1965) book²⁰ as a significant factor which converted many people to the ecological cause. He exposed the persistent and continuous poisoning of the whole human environment by pesticides, fungicides and herbicides and warned of their effect on the planet's ecology. With the circulation of books such as *Silent Spring*, the previously overlooked side-effects of industrialization and advanced technology started to become matters of concern for the West (Ibid.).

The design profession came in for public criticism too. Town planners and architects were held responsible for

²⁰ Carson, Rachel, 1965, *Silent Spring*, London.

creating the high density, high-rise concrete jungles that fuelled inner-city tensions and social unhappiness. The new agenda filtered into the profession's debates: the International Council of the Society of Industrial Designers (ICSID) selected 'Design, Society and the Future' as the consciousness-raising theme of their sixth annual conference, held in London in the summer of 1969. Planners and designers were urged to shift their viewpoint from quantification to the quality of life in the 'post-industrial' society (Ibid.). According to Hasan Ozbekhan²¹, director of planning at Santa Monica, "The problem is to redirect our energies and all the technology which is at our service toward renewed human ends - ends which are not given, as was survival amid scarcity, but are now in need of being invented." A similar point was made in an editorial in *Design*²², which was reviewing the conference proceedings: "If we are to avoid mistakes similar to those of the first industrial revolution, then we have to make sure that modern technology is geared to take us where we want to go, and not just where the next step happens to place us."

Following the publicity surrounding the United Nations Conference of the Human Environment held at Stockholm in June 1972, public concern reached a peak. A 152-member committee of scientific experts and social commentators from 58 countries served as consultants in preparing a report commissioned by the Secretary-General for the conference, and this was published worldwide as the seminal *Only One Earth*, edited by Barbara Ward and Rene Dubos. *Only One Earth* outlined the current state of the planet and assessed the problems of high technology: the price of pollution; the use and abuse of the land; and the balance of resources. It examined the particular problems of the Third World and suggested global strategies for survival.

Only One Earth was criticized by some ecologists as not going far enough, while others dismissed it as alarmist. The problem with any global strategies is that they inevitably threaten various short-term national priorities and some politicians' vested interests²³. However, the oil crisis of 1973 emphasized the relationship between natural resources, politics and social systems, and the sharp increase in petrol prices and fears of rationing provided the general public in the West with a foretaste of what they would experience if global oil supplies became severely depleted. Yet in spite of this sobering experience, the media and the public's interest in Green issues began to wane. In this regard, Whiteley (1993) asserts that the stimulus for change was taken up by pressure groups and organizations such as 'Friends of the Earth'²⁴ while some governments pretend to consider the environmental accountability by legislating on lead-free petrol, recycling and 'acid rain', etc.

As an introductory to a document, which was posted on-line by the United Nations Department for Policy Coordination and Sustainable Development (DPCSD) held in Paris in 1995, the major changes in the way of implementing the issues of economic growth, human development and environmental protection were witnessed. The same source states that the United Nations Conference on the Human Environment, held at Stockholm in 1972, was the first major discussion of environmental issues at the international level. The agenda was immense, touching on virtually all aspects of natural resource use, but the focus was on the threat to the natural environment posed by economic growth and industrial pollution. Developing Countries, for whom these problems were still largely irrelevant, argued that poverty posed a greater threat to both human welfare and the environment, and that economic growth in their case was not the problem but the solution. Stockholm, thus, marked a polarization between the priorities of economic growth and environmental protection which has dominated the debate between Rich and Poor Countries, and between interest groups within countries, for many years and is still not fully resolved (Ibid.).

The same report stated that during the 1980s, a new political and developmental paradigm emerged which appeared to reconcile these conflicting objectives. In 1987, the World Commission on Environment and Development published its report *Our Common Future*, better known as the Brundtland Report. The report set out the concept

²¹ Ozbekhan, Hasan, quoted in anon, 1969, "Technology: Good Servant or Errant Monster?", in *Design*, October 1969, p. 56.

²² Editorial, 1969, "A Choice of Tomorrow", in *Design*, May 1969, p. 25.

²³ The 'Global Summit' in Brazil in 1992 highlighted a similar problem.

²⁴ Founded in the USA in 1969 by David Brower who dismissed the policies of the then best-known environmental organization in the USA club, as too inward-looking and parochial.

of 'sustainable development', an integrated approach to policy- and decision-making in which environmental protection and long-term economic growth are seen not as incompatible but as complementary, indeed mutually dependent: solving environmental problems requires resources which only economic growth can provide, while economic growth will falter if human health and natural resources are damaged by environmental degradation.

It was also reported in the same source that publication of the Brundtland Report set in motion a process which culminated in the United Nations Conference on Environment and Development (UNCED), held at Rio de Janeiro in 1992. It was also mentioned that a comparison of the action plans produced by the Stockholm and Rio Conferences illustrates a major shift in understanding of, and approach to, the problems of long-term human development. Where Stockholm adopted an issue-oriented approach to pollution and non-renewable resource depletion, Rio emphasized **integrated strategies to promote human development through economic growth based on sustainable management of the natural resource base**. The UNCED action plan, Agenda 21, reaffirmed the Brundtland Report's central message: socioeconomic development and environmental protection are intimately linked and effective policy-making must tackle them together which is also one of the thesis's recommendations asserted in the Conclusion.

To review and appraise the implementation of Agenda 21, Razali Ismail (1997), the Malaysian U.N. General Assembly president, called the results of the Earth Summit+5²⁵, attended by dozens of presidents and prime ministers, 'sobering' as environmentalists as well as Poor Nations expressed disappointment in the results. He accused the more than 170 participating nations of being at the mercy of special interests and lacking the "political will to tackle critical issues" set out at the landmark 1992 environment summit in Rio de Janeiro. Specifically, delegates made no firm commitments on greenhouse gas emissions that cause climate changes or on providing more aid to Developing Countries so they would not follow the polluting paths of wealthier nations.

• The Politics of Green Design

In the literature, at one extreme there is some Green Organizations opposed to virtually any consuming; and at the other the capitalist who believes that Green problems can be solved by market forces. This has been adopted by those governments in the West who are employing a policy of either taxing 'dirty' products, or subsidizing 'friendly' products. Indeed, Greens believe that viewing politics as a left/right continuum is outmoded and misleading, because left and right have much that is negative in common. This is a point made by Jonathon Porritt (1984, p. 44), previously director of Friends of the Earth and a leading spokesperson for the Green movement:

"Both are dedicated to industrial growth, to the expansion of the means of production, to materialist ethic as the best means of meeting people's needs, and to unimpeded technological development. Both rely on increasing centralization and large-scale bureaucratic control and coordination. From a viewpoint of narrow scientific rationalism, both insist that the planet is there to be conquered, that big is self-evidently beautiful, and that what cannot be measured is of no importance. Economics dominates; art, morals and social values are all relegated to a dependent status." [an emphasis has been given here by the author to emphasize on some of the preactivists' characteristics which can be found in many governments and private agencies' attitudes.]

The same source concludes that the similarities between the two dominant ideologies are of greater significance than their differences. The fundamental ideologies are, Porritt continues, united in an all-embracing 'super-ideology' for which he employs the term '**industrialism**'. Therefore, the thesis's argument is that the industrialism is the greatest threat to our societies, if it is conditioned to increase the exploitation of both people and plant.

Most Governments and main political parties claim to be sympathetic to Green issues, but their 'Greenness' is subservient to their prevalent ideologies which, from a Green point of view, may be inconsistent, contradictory, or in fundamental conflict with their Green policies. Saying that, Whiteley (1993) suggests that even if a 'Green ministry' or Green-tinged Department of the Environment were set up, these might simply be tokenism or even a

²⁵ Earth Summit+5: Special Session of the General Assembly to Review and Appraise the Implementation of Agenda 21, 1997, United Nations, Department for Policy Coordination and Sustainable Development, Home URL: <http://www.un.org/dpcsd>, New York, 23-27 June 1997, in Watch Earth Matters on CNN and CNN International.

marginalization of Green issues. It can be argued by the author, therefore, that Green policies must underpin all governmental legislation if the issues are to be taken seriously.

Whilst a life-crisis may indeed be the outcome of adopting a commitment to a Green way of living, it is also useful to consider some questions on Green Design. 'Ten questions for the Green Designer' listed in a booklet prepared for the Design Council by John Elkington Associates in 1986, and subsequently reprinted in Elkington's book in 1988 are listed below:

1. is there a risk of disastrous failure? (Elkington cites the social and environmental disasters at Bhopal in India where over 2,000 people were killed as a result of a chemical leak at the Union Carbide factory, and the Chernobyl nuclear disaster. Environmental impact assessments, risk assessments and rigorous safety standards all help in avoiding such failures.)
2. could the product be cleaner? (The same source indicates that catalytic converters and lead-free petrol for cars, and ozone-friendly aerosols are examples of how products can be made cleaner in their performance.)
3. Is it energy-efficient? (It has been calculated that many is wasted because of inefficient energy usage. Bad insulation in houses, and the utilization of waste heat from industrial production methods, are both areas that could be greatly improved.)
4. could it be quieter? (According to the same source, the problem associated with the subject is getting worse.)
5. should it be more intelligent? (As the cost of computing power decreases, more and more products can be designed with features which monitor and modify their own performance.)
6. is it over-designed? (The author argues that the Green Designer should constantly challenge the client's assumptions by asking whether the product needs to be so heavy, so strong or so powerful.)
7. how long will it last? (Many products are badly-designed in that they break down before their materials decay.)
8. what happens when its useful life ends? (The model of endogenous development emphasizes on the reuse or recycling which should become a central component of a product's original design or any kinds of design.)
9. could it find an environmental market? (Even some of the most dangerous materials can be transformed.) and
10. will it appeal to the Green consumer? (Elkington argues that 'Good Design' helps communicate ideas and sell products ... the emergence of the 'Green Consumer' is simply a matter of time.)

• Some Criteria for Green Design

Usual definitions of good design include criteria such as: **successful performance, ease of use, safety, simplicity of maintenance, appropriate materials, efficiency of manufacture, attractive appearance and value for money, etc.**, and the importance of each criterion varies depending on what it is applied to. The thesis will examine the extension of these criteria in Chapter Four, where symbolic principles are seen as the main part of the design process which makes it to be a part of the process of life. This will also help considering the design process as a mean to be able to initiate social and cultural interactions and development prior to its products. Being in the line of those who defined some instrumental principles of good designs, Burall (1991, p. 16) has classified the basic principles of designing for Green markets, which the environmentally aware designer should aim to, as:

- a) increase efficiency in use of materials, energy and other resources;
- b) minimize damage or pollution from chosen materials;
- c) reduce to a minimum any long-term harm to the environment caused by use of the product;

- d) ensure the planned life of the product is the most appropriate in environmental terms, and if necessary that the product functions efficiently for its full life;
- e) take full account of the effects of the end disposal of the product;
- f) ensure the packaging, instructions and overall appearance of the product encourage efficient and environment-friendly use;
- g) minimize nuisances such as noise or smell; and
- h) analyse and minimize potential safety hazards.

• **Green Design, Need, and Consumerism**

To evaluate the Green Design, it would be useful to ask question about the ultimate cause of propounding the solution. This leads directly to a question which must underlie all others: 'Do I need this product or service?' Therefore, any discussion of Green Design has to deal with the question of society's values, and Greens would effectively argue that the values of many societies of today are too materialistic, too competitive and aggressive. It is not simple to distinguish the differences between 'needs' and 'wants' in a society that is accustomed to abundance and sophistication. The question about whether one needs the particular product or service is one that applies not only to Green issues but also to all the other issues discussed in this thesis, whether the 'socially useful' product debate, 'responsible' design, or 'labour-saving' gadgets. It has been also discussed that the Green belief is one of simplicity in which 'less is more': the quality of life matters more than the material standard of living. But, Green's main argument about increase efficiency of material, energy and other resources, and minimal damage or pollution from chosen materials, followed by the sustainable issues, has been a base for international coordinations in determining the development problems.

• **Energy Consumption and Energy Conservation**

Energy and raw materials are fundamental to economic activity and human well-being. As the size of the world economy has grown (approximately fivefold since the Second World War), so resource consumption has accelerated at a rate unprecedented in human history. During the 1960s, energy and steel use in the Industrialized Countries increased at rates that would have doubled total consumption by 1987 and quadrupled it by 2000. This pace and scale of growth gave rise to fears that such exploitation rates of non-renewable resources could not be sustained. During the 1970s, predictions abounded that the world would shortly 'run out' of fossil fuels and other essential raw materials (DPCSD, 1997)²⁶.

The Brundtland Report of 1987 pointed to the tensions between increased levels of energy and material use required for economic growth in Developing Countries and the environmental (and hence financial and social) costs that could be expected from business-as-usual growth in the Developed and Developing World. It called for a major reorientation of policies towards efficient technologies and conservation efforts but anticipated that even this solution would not prevent increased levels of global and regional environmental degradation. The challenge today remains the same: to meet an enormous projected global demand for resources, especially energy, through the use of new products, technologies and consumption patterns. Now, concerning these problems, if the answer to the question 'Do I need this product?' is yes, then a first thing to certify is whether the product is energy-efficient. However, it is also important to look at an issue in the questions of Green Design: processes of production and their relationship to the people.

Nowadays, much attention has been focused on the rainforests' role in regulating global weather patterns. As they are destroyed, through or by abusing forests for wood, rainfall cycles are disrupted and a warming of the earth's atmosphere occurs - due to the build up of carbon dioxide - that has become known as the 'greenhouse effect'. One way of solving this problem might be to use the power and force of consumers. In this regard, Cox²⁷ (1989, p. 195) suggests a combination of consumer and designer/maker's pressure as a way forward.

"The consumer on his/her own can do little, but thousands of consumers exercising choice have an

²⁶ United Nations Department for Policy Coordination and Sustainable Development (DPCSD), 1997, The document has been posted for the Commission on Sustainable Development, Fifth session, 7-25 April 1997, Item 4 of the provisional agenda.

²⁷ Cox, Chris, 1989, Association of Woodusers Against Rainforest Exploitation (AWARE), information pack.

awesome power. We, in the trade, have to begin to exercise that choice. If the choice is not there yet, we have to demand it We need to know under what circumstances our timber was produced in the same way we want to know its quality, colour and price If there are enough customers out there who want to buy mahogany from a sustainable source, but do not want it otherwise, eventually this will filter back up through the industry to the people who can do something about it It worked for people who wanted to know what the food they bought in packets consisted of."

• Green Design and Sustainability

The key principle for a green world is said to be Sustainability. Professor David Pearce has defined, in *Blueprint for a Green Economy*, a sustainable economic system as one in which: "The well-being of today's generations is not increased at the expense of future generations Each generation should ensure it passes on to the next a stock of assets no less than that which it inherited. The Brundtland Commission, in its report²⁸, defined sustainable development as: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The author would like to end this discussion about Green Design and form another discourse whose aim is to focus on the design itself. This will help us to form an appropriate context for the author's later arguments about design process which is rather abstract and universal.

i) The Community Organizations

Many Architects, like the other professions of built environment, have been tried to make the participation of the users possible. Some, in Developed Countries, had significant achievements by using the existing structure of their societies. Although most of the documents (theoretical or operational) are about the efficiency of their fields, but some of them are worth mentioning. For example in the U.K., the problem of identifying the user client was one of the main obstacles to Community Architecture of making a significant impact of satisfying user interests.

Architects often have to educate and advise clients, and possibly undertake research to establish their detailed requirements. Community architecture is not a real possibility and 'briefing' has to be relied upon in order to satisfy users' design interests (Scott et al., 1986). Briefing, is said, as a feedback from completed schemes and research has some disadvantages, one of which, as compared with participation, is **that users play a comparatively passive role**. Moreover, as Tom Woolley (1986)²⁹ argued: "The idea of direct user participation seems an attractive one, when despite years of research and investment into users studies, design guides, design methodology and the like, architects still seem to get it wrong."

The Community Organizations seem to be collections of ideas and social forces rather than something which can be defined in a very specific way as a particular form of architectural practice. Woolley (1986, p. 10) argues: "We found ourselves full of idealism and yet remote from ordinary people, working in offices where users' needs were well down the list of priorities." **The architectural profession, is said, was sustained by a belief system of social responsibility but had little commitment to put it into practice.** Another factor, which is interesting to Woolley (1986, p. 11), resulting from a growing struggle for survival by a profession is described by him as: "Even some of the trappings of professionalism, the code of conduct, for instance, was discarded, providing opportunities for experimentation with projects that held higher risks and lower profitability. This was only possible because of major changes in legislation and state social policy which created new kinds of projects and new kinds of clients."

There is no doubt that the demand for consumer control in different forms is one of the significant issues for architecture. Of particular relevance to this claim is the emergence of user-controlled client groups, for example **housing cooperatives, self-help and self-build groups, voluntary organisations in the inner city of cooperative workshop projects**. The increasing power of such groups has also created a need for a different kind of architectural service. Defining Community Architecture, Woolley (1986) has said that it is essentially a set of attitudes or ideas by which the more innovative have tried to respond to demands and needs from building users.

²⁸ The Brundtland Commission, 1987, *Our Common Future*, Published by the UN World Commission on Environment and Development.

²⁹ Quoted in , Scott and Jenks, 1986, Working Paper of Community Architecture, No. 95, published in London, p. 7.

These attitudes represent a willingness to share the creative experience of building design and development and to join in with what is often a hard and political struggle by community groups to achieve their objectives.

Some argues in Community Architecture that user involvement in design leads to greater user satisfaction. On the contrary, more than one of the members of the Community Architecture have claimed that "direct contact between architects and users is probably the optimum solution to meet the objective of providing housing that is closer to the requirements and wishes of those who use it." (Darke, 1984)

Apparently, **the participation process for those who have survived it is very much a learning exercise.** It is best summed up by the comments of tenants who said that if they could go through it all again they would make a much better job the second time. It is also a kind of job through which the architects usually work incredibly hard to involve participants in the design. Every member of the party should go to a lot of meetings and somehow a design emerges in a process that is hard to evaluate or reproduce.

There are many experiences show the success of users' participation. For example, Woolley (1986) writes that in some cases the tenant participation schemes revealed enormous benefits to the people involved. They got better housing than they might otherwise have expected, they benefitted from the experience of managing aspects of their lives and exercised some control over their environment. They also successfully began a search for forms of housing that more closely reflect peoples' needs and aspirations.

Nicholson (1986, p. 39) suggests that there might be two kinds of Community Architecture:

1. "the community activist architect, where the architect takes on the position of social condenser, either as the initiator of a particular project or as the only too willing participant in a project; and
2. the architect involved in a particular community, and in the development of the design."

Defining architect's role, the same source in page 39 indicates: "Architecture in our book is the means of providing social facilities, facilities which enable people to live a fuller life than was possible before, though not necessarily in a prescribed way."

Nicholson (1986) also says that architects' deepest concern is the progressive shallowness of architectural production and its unaesthetic qualities. **Some of them consider scale and believe in smallness because it allows them to react. They believe that a greater public discussion of architecture is important for the future of architecture and as a general democratic activity; they hold very strongly the belief that however painful the planning process may be, it is fundamentally good because it forces people to discuss the issues. Even then they are not discussed always vigorously enough.**

Considering the active participant, the user, **one can think of Habraken whose disciples in the seventies created a small housing scheme based on the principle that all you need to do is provide the structure and the services and then the tenants could organise everything from then on.** But, it is publicly owned and however wonderful the authority might be, partitions are clearly not going to move, and the housing managers are not going to allow them to move, if they can help it (Nicholson, 1986, p. 41).

The problems with the second kind of Community Architecture are mentioned by Nicholson (1986, p. 42) when he describes his experience of attending the several meeting for rebuilding a committee. He says: ".... Over five years we attended 75 meetings, all of them in evenings, of an elected committee of local representatives who were answerable to another level which was the Parochial Church Council. Both of them felt themselves answerable to the community at large, whether or not they were church goers."

To understand people's needs is another issue which calls for more attentions and deep concentration. Different approaches may be launched for this understanding. Scott (1986), using the method an anthropologist used to study a situation, indicates that he found he was first aware of:

- a) the physical environment; then of
- b) the activities of people going on in it; next
- c) their social relationships; followed by

- d) the norms of conduct which ordered their relationships; having found them,
- e) he found out about their perceptions, feelings, their attitudes and their values; and
- f) at the deepest level, he found out something about their idea of the world and reality.

It is good to ask questions about the outcomes of the design processes and to see what kind of value they have. And, are they relevant to the needs, demands and aspirations of society? are they legitimate, or simply nostalgic sentimentalism? Indeed, are they even realisable? Perhaps the key element to matters of value is motivation to action. If one values something one is motivated to bring it about. The trouble is that there are very few consistent classifications of motivation. One attempt at classifying community motivation is that of belonging or sharing. **Maslow (1954 & 1987), who is one of the best known people in this field, calls community a belongingness or love need or motivation.** Scott (1986) argues that the important factor is sharing as distinct from personal advantage. He says that distinction³⁰ characterises different positions on the political spectrum. Another stated value of community is that of wholeness and integrity³¹. This is why architects should be interested in both these things, because the wholeness of community corresponds with the wholeness of building and environment which architects are so interested in.

Prince Charles made a number of remarks, in his speech to the RIBA, on community architecture. Scott (1986, p. 49) refers to some of them as: "It has been most encouraging to see the development of community architecture as a natural reaction to the policy of decamping people to new towns and overspill estates where the extended family patterns of support were destroyed and the community life was lost." Community being here used in a descriptive sense without it being clear how unified that life actually was. He also said: "For far too long ... some planners and architects have consistently ignored the feelings and wishes of the mass of ordinary people in this country, and except in interior design courses students ... (never) meet the ultimate users of buildings in their training." He commended "co-operatives, particularly in the inner city areas of Liverpool, where the tenants are able to work with an architect of their own who listens to their comments and their ideas and tries to design the kind of environment they want, rather than the kind which tends to be imposed on them without any degree of choice." He believed that **"If people have played a part in creating something they might conceivably treat it as their own possession and look after it"** which was the second of Tom Woolley's beliefs which he said was not, unfortunately, supported by evidence. Prince Charles also said he believed it "important about community architecture that it has shown ordinary people that their views are worth having."

The sociologist C Wright Mills in 1959 spelt out a problem, which is also the designers' problem of today, as: **"Are we to respond to what people are interested in or what is in their interests?"** The trouble about responding simply to what they are interested in is that it can be transitory, subject to fashion, and conditioning through the persuasion of vested interests, and is usually conservative, such as we see in the private housing market and with building societies. Scott (1986) pinpoints the danger of providing what is in people's interests and says that it can be autocratic, non-democratic, unaccountable, and responsible in part for uprooting 'communities', large scale developments, tower blocks, etc. This results from attempting to act in people's interests without looking at what they are interested in.

Nick Wates, the chairman of the Working Paper at the conference held at Oxford Polytechnic in 1986, summarized a number of organisations to help people to make their home or their neighbourhood being involved in self-build projects through to inner city neighbourhood projects. They can be classified as:

- a) on the political level; (like the RIBA Community Architecture Group)
- b) ACTAC, Association of Community Technical Aid Centres;
- c) local authorities' employment of architects; and
- d) voluntary groups and organisations.

³⁰ This distinction is possible by using deductive approach in the process of design which enable architects to make their plans (see design process in Section 2.B).

³¹ Integrity and wholeness of building need the inductive approach which enable architects to make the model of their plans (see design process in Section 2.B).

Referring to some difficulties associated with the communities, the author's attempt is to find a practical way of users' participation. Therefore, some of them, like what Peter Hughes (1986) says, are worth mentioning. He claims that one of the worst things is to have a scheme on a wall in a committee and the attempt to describe it to a body of laymen. He suggests a more relaxed atmosphere to gain more progress. Peter brought an example and said: "One of the best design workshops we ever had was about a little village school, just after it had been gutted by fire, and everyone was very distraught. We set up the design workshop in the local pub which was very enjoyable. **If you can get that atmosphere and break down the bureaucratic barriers and get people to see themselves as people with the rare opportunity of getting involved in architecture, then, the whole atmosphere changes.**" [the author's emphasis] Peter then claims that there has to be a basic transfer of control or power otherwise there is a possibility of having only a smoke screen. In his experience, **the motivation of people is that they want to own and control something**, so that it will be treated better. He says that there has to be a transfer of power from the bureaucrats and the professional to the community.

Many scholars sympathize with Hughes's idea and claim that because education has a basic role in spreading the seeds of socially useful product, as Papanek (1984) suggests, the schools should be community minded. Bringing an example from the case study Iran, the author would like to mention some of his experiences as a lecturer in Shahid Beheshti University and Tehran University. Most of the projects after Islamic Revolution, for example, in the Department of Architecture in Shahid Beheshti University were group projects. Students used to start the idea of working together and having to compromise with other people in order to achieve an end product. Students in early years were being involved in outside projects to do worthwhile research, feasibility studies on what many might regard as mundane projects, e.g. what to do with a courtyard.

j) Design Process

The following descriptions are quoted from Bax (1989) who propounds a three dimensional model for the process and the procedure of design. He tries to shed light on the definition of the design which is more focused on the instrumental principles and see design as a problem solving approach. He is using different terms such as: activities, design fields, levels, domains, and phases which are fitted into a model called Gom-Model.

• Design Fields, Levels and Domains

Bax puts forward his discussion and defines some details of this procedure and says that the content of an activity regards principally the change of a form. This means the transformation of that form into another one which better fits the purpose of the object in function or performance. Function and form are inseparable. However, there has to be a fit of functional demands and the properties of the form when the design process ends. Function and form are complex entities and there are lots of fits feasible between various functional and formal categories before there is a total fit, which means consensus between all the parties involved. These categories of functions and categories of forms define 'design fields'.

It is clear that architectural designers and urban designers are working in two different design fields. Their work concerns two design fields on two different levels on which the form of an object appears; both are working with spatial elements. But, the appearance of a building in an urban plan looks different from the appearance of a building in the architectural plan; the first is global and the latter is more detailed in its form. In the same way, it may be clear that users of a building are dealing with other sets of criteria to evaluate the building than structural engineers or contractors do. These different sets of criteria correspond with different categories of functions or performances of the designed object under consideration: utility, durability and manufacturability are functional categories, the so called 'domains'.

Bax believes that in the process of design designers have to surpass the systems theory of mechanical notion of 'composition order' and the hierarchical notion of 'action order'. He says that the process of design is a process of decision-making with a growing awareness of its purpose and an increasing degree of specification of the form of the object. On the start of the process the object is less specific than on the end of the process. It follows the line of specification from a global to a more detailed definition of the object.

The description of the form of an object on different levels of specification is illustrated by an example cited by Bax (1989): the setting of a table for a meal. The use of the concept levels as design fields is demonstrated by accommodating design activities (Figure A.1.2).

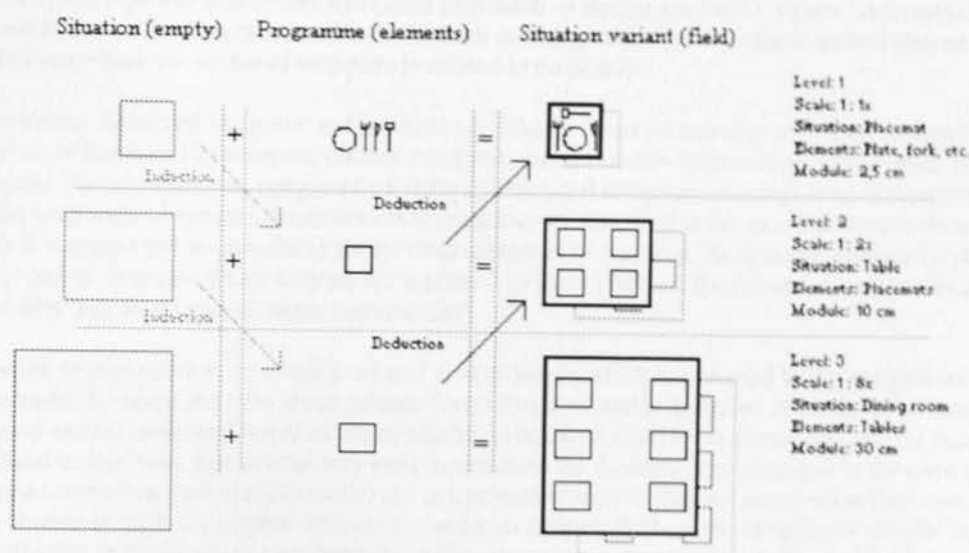


Figure A.1.2 Levels of specification
[derived from Bax (1989)]

In the example of setting a table the situation is the table with its dimensions given: 80×120 cm. The programme is a set of elements: dishes, forks, spoons, knives, 4 of each of them, because the table has to be dressed for 4 persons, and rules for the relations between the elements, which in here are obvious, but in more complex cases have to be specified in details. The process can be made less complex by grouping the different elements of the programme in the hypothetical 'place-mat' so that, when dressing the table, only the 4 place-mats have to be taken under consideration. There are different ways to set the table and each solution fits the demands of the programme and has from that point of view the same value: there are variant solutions or just variants. Of course, only essentially different solutions are of interest. This is the reason to introduce a module for measuring on the specification level of the table; a measure which is relevant for both, the elements of the situation and the elements of the programme, e.g. 10 cm. The larger the model, the higher the relevance of the variants. Perhaps 30 cm is also usable as a module, but it is clear that 60 cm is too large.

When there is a transition in modality and an entity changes from situation to element or reverse, designers have to deal with a transition of levels. Levels are characterised by a set of elements, but also by the type of situations, e.g. buildings, neighbourhoods, districts, ..., modules and grids. Design procedures are primarily processes of specification leading to differentiation of space and material. Because of the situation - elements - exchange mechanism which defines the transition of levels, and as such the levels, the ordering of design processes of generalisation, the last are not used in formal design procedures, but they are important in that part of the overall design process where the formal procedures are prepared. **Processes transforming objects to higher level is called 'inductive' process, and processes transforming objects to a lower level is called 'deductive' processes (Bax, 1989). The inductive processes result in 'models' and the deductive processes results in 'plans'.**

For reasons of participatory decision-making, it is important to use a concept of levels where in an inductive process the architectural situation becomes empty in order to function as an element, a model which in a reversed deductive process can be filled in by an architect who is specifying the model in a way not planned for in the model phase of the process. For structuring the design process it is necessary to open the process each time in order to a new parties on another level become involved in the process (see also the Conclusion of People's Participation in Chapter Two).

The functional description of the machine generates lots of forms depending on the (technological) conditions which define the context in which the machine has to be built. The same source claims that this is an arrangement to stress

the functional aspect in a so called **structural approach of design problems**, where 'structures' mediate between form and function, structural in the French meaning of the word which is quite different from the English one where the notion of structure is related to form only.

Nevertheless, functional categories make sense only when a direct relationship with form is possible. Some categories of functions like transport, utilities, residence, etc., are as sub-systems of an overall urban system. So, for reasons of conceptualisation, designers are looking for functional categories on a high level of abstraction which are valid in all artificial systems. These functional categories are described in the so called 'domain theory'. In this theory it is argued that in each object always three categories of functions, the domains, explain the state of the subject and its dynamics. These domains are explained by Bax (1989) as: the domain of 'utility', the domain of 'durability' and the domain of 'manufacturability'.

The same source refers to an example related to architecture which is restricted to the category of so called 'instrumental' functions and talks about column. It says that a column is described about the three domains. The functional analysis is the analysis of an object which is primarily defined by its geometric form; the functions are all related to this form, that is what they have in common; the functions are integrated in the form (the form performs several functions simultaneously) and in a process of analysis they are perceived in their own right. In the domain of utility the column differentiates space in different fields of use, suitable for specific human and social activities. In the domain of manufacturability the column has meaning in terms of material, labour and tools; the column is described as work like in the terms of reference of a building; the costs can be easily deduced from this type of analysis. In the domain of durability the stability through time of the column is subject of analysis: the reliability that the column will achieve its performance over a specific period of time. **Moreover, within specific forms of vernacular architecture the column in the centre of the house also has the meaning of the axis of the world. It fulfils a 'symbolic' function, which is important for a complete understanding of architectural design** [this point is the major concern of the thesis which help effective people's participation in design process and is fully discussed in Chapter Four, The Model (4.B.)].

• **Tuning Form and Function**

On a given moment in the process, the content of 'form' is evaluated against the criteria of 'function'. The result can be: adjustment of the form, the function, or both. Bax says that both processes are sub-processes of the cyclic process; **analysis, synthesis and evaluation** are the modes of this process; the process will have to be carried out several times before the form fulfils all the functional demands. This situation will be approached step-by-step, each step bringing the acceptable state closer for all parties involved; therefore the process is an iterative process. On the end of the process, the form-vessel is filled and the function vessel is empty: all functional demands are translated in form. This is a part of 'production process' when architect is himself/herself the user of the building.

Design strategies are design procedures where activities, concerning the form and level type, are arranged in a purposeful order. **This means that the procedure also has to be tuned to the social and political environment of the project; it means that the parties who are responsible for the process have to be recognised and 'attached' to objects within the activities of the process.** Activities in this respect are design tasks which have to take place within the physical boundaries of the project, also expressed in terms of time, budget and mandate.

Because the influence of the parties is expressed by their position in a sequence of decisions and as such related to the phases of the process, Bax calls this dimension 'the process dimension' of the architectural object. Just like the form-dimension is articulated in levels and the function-dimension in domains, the process-dimension is articulated in phases. To the various states of the architectural object is respectively referred as: '**formal state**', '**functional state**' and '**temporal state**'. These phase bound activities are in contrast to the other two categories of activities subject to a specific order of time. The process cannot, like in the two other activities, be reversed. It is not a personal activity in the head of an individual designer, but a social activity bound to a contract with the parties in the process including people. Because of the strict form of the process, it is called a procedure.

As far as the process modality of the model is concerned, the same form of the matrix is used: in the up-down dimension of the matrix processes are made visible which tune the form of the object to forms on higher and lower levels; in the left-right dimension processes are made visible to fit the form of the object to the functions of the different domains; in the before-after dimension of the matrix processes are made visible which tune the form/function combination of the object to demands generated in the past and yet to come phases of the procedure.

Ordinance, integration and development processes are the names which are coined for these different types of processes. These processes and states constitute the design fields for architectural design. These processes are composed from activities which, dependent of the modality of the model in which designers are working, have names according to the processes (ordinance, integration, development) which they, the activities, compose, or the states (level, domain or phase) which they transform (Figure A.1.3).

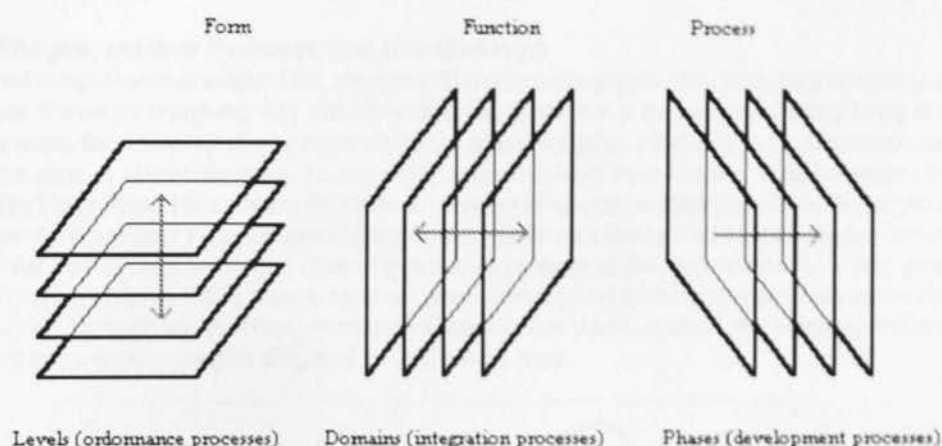


Figure A.1.3 Form, function and process
[derived from Bax (1989)]

k) Complex Shapes

• Symmetric Shapes

A first step which is commonly taken to try to make sense of a shape is to look for symmetry in it. The derivation of the word symmetry gives it the very general meaning of referring to parts with similar geometrical properties, and many things that help having parts with similar properties. There is no doubt that an orderly symmetrical arrangement of similar parts as a shape is much more comprehensible and graspable by the mind than are that does not contain any similar sub-parts, or if those parts were just scattered, without any rational principles of arrangement. There are relatively few possible types of symmetry. In two dimensions, there are basically three types of change that determine the three basic types of symmetry. These are 'reflection', 'translational', and 'rotational' which are shown in Figure A.1.4.

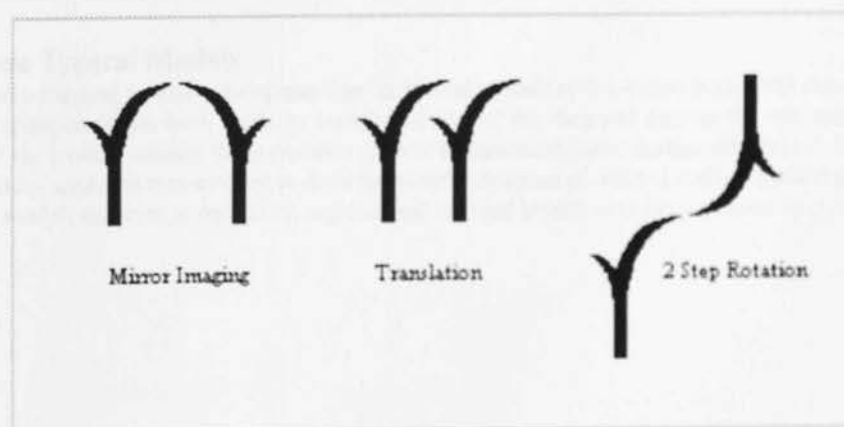


Figure A.1.4 Some symmetrical relations of a shape
[adapted to Waddington (1977)]
Source: the author

Examples of perfect symmetry in the real world are the arrangements of atoms and molecules in crystals. In solid three-dimensional structures, there are more possibilities of symmetry (Waddington, 1977). In many cultures artists have used pattern symmetry as a method for introducing a certain definite but not sense of order into their productions. However, symmetry is certainly not the only property which can share a degree of visual unity to a shape. There are other arrangements, in which the parts are related in some specific mathematical ways, which the mind can accept as orderly, even when it cannot immediately express the precise arrangement underlining the order.

• Shapes, neither Symmetrical nor Ordered

Many natural complex shapes exhibit little symmetry. The conventional procedure is to think of them in terms of their outlines. The outline is probably very difficult to describe. Moreover, if the concern is with a living thing such as a fish, or worm, the outline will change drastically as the animal wriggles, yet clearly in the same sense the shape remains the same or almost the same. An alternative way of treating these kinds of complex shapes has been developed by Harry Blum. He considers the shape as made up of several overlapping circles, the largest that can be fitted into the shape (Ibit.). The centres of these circles will lie on a line or a set of lines. Such a line is known as the 'medial axis' or 'symmetry axis', since it expresses a property of the shape related to a very generalized concept of symmetry (Figure A.1.5). Clearly, there are many changing and growing shapes which can be described in this manner. By applying the Blum technique of 'medial axis transformation', the complex outline can be transformed into somewhat simpler shapes of internal medial lines.

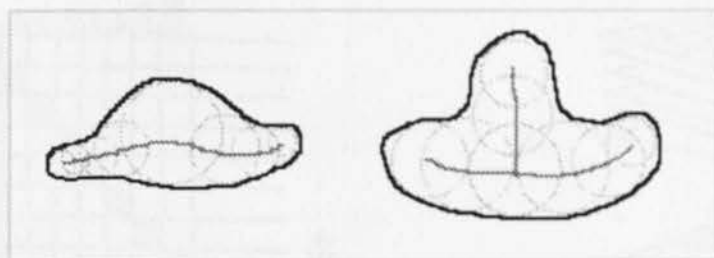
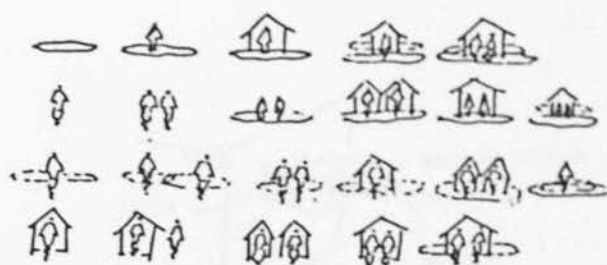


Figure A.1.5 A shape is made up of a number of overlapping circles whose centres are on the 'medial axis'
Source: Waddington (1977)

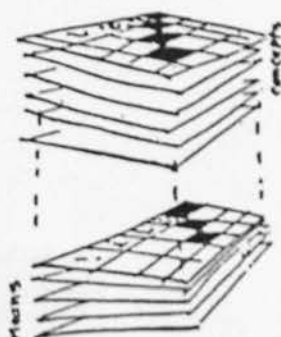
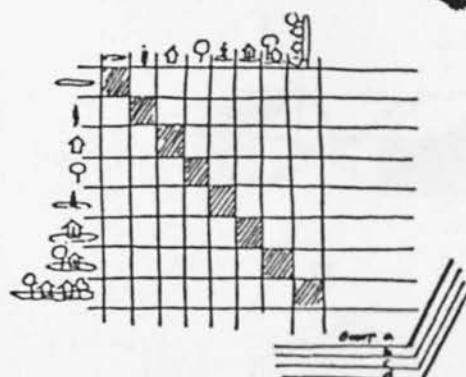
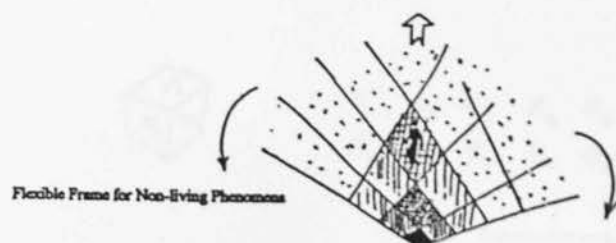
A shape, however complex, can only be a description of an appearance; but to begin to understand a thing or a system, there is a need for finding out about its structure. Beside Carter's description of structural and process relationships in system view, the simplest kind of structure of a complex system is a hierarchical chain of command, such as one finds in an army. If one makes a diagram with a dot for each individual, then they can be arranged in a tree-like order, corresponding to the chain of command and responsibility. This is a very simple type of organized structure that make it clear which level or levels of hierarchy any person belongs to.

1) Some Typical Models

Matrix and their diagonal axis have been exercised in several models by the author from 1983 onwards. In these models, more emphasis has been made to explain the role of the diagonal axes as the essential parts (deep structures) of the models causing the generation of their nonessential parts (surface structures). Following this experience, a cubic approach was adopted to show the genetic structure of sectoral activities in a regional plan. In the following models different scales (local, regional and national levels) have been a matter of concern.



Different Relationships between Man and Environment



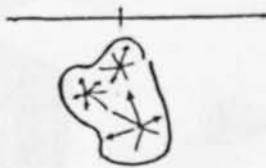
Considering the Secondary Components in the Grid through out Different Layers



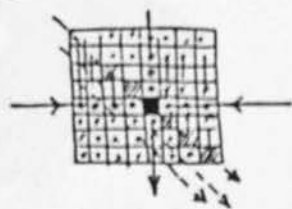
Vertical, Horizontal and Diagonal Relations of a Matrix

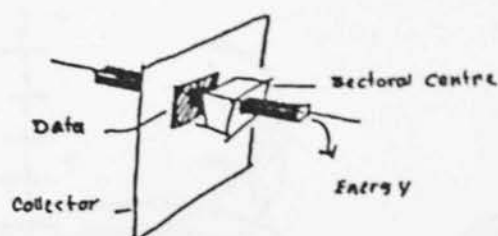


Mutual Matrix in One Relationship



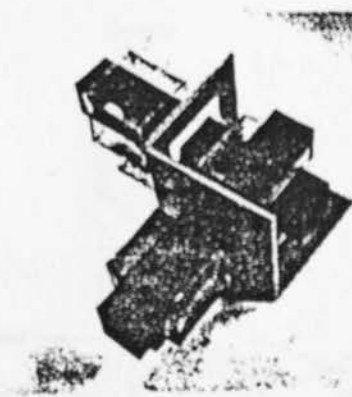
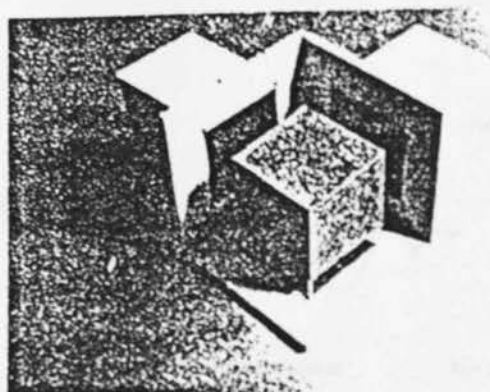
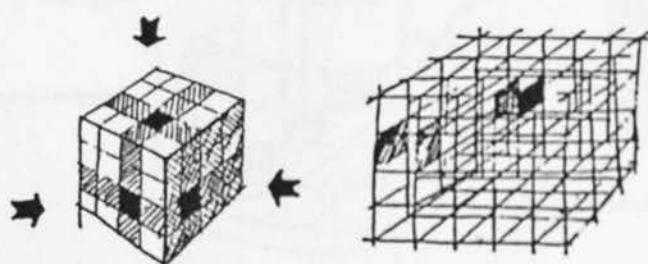
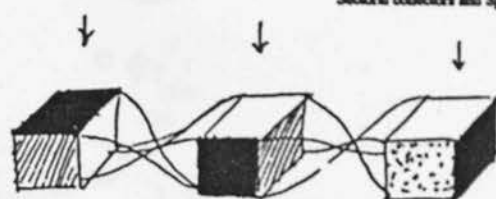
The Hierarchy of Programmes (Acts, Facts, Dreams and Deeds)



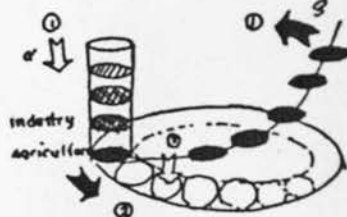
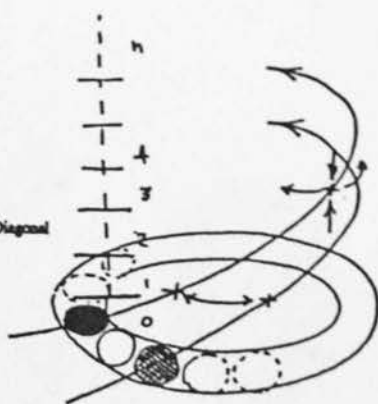


α_1 α_2 α_3 α_4 α_5 α_6
 β_1 β_2 β_3 β_4 β_5 β_6

Sectoral collectors and Spatial Cubic Grids

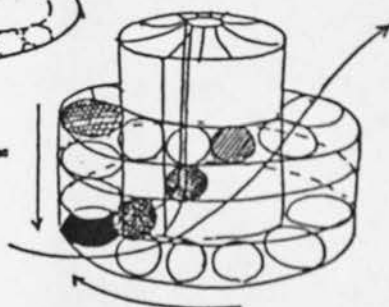


Tracing the Forces used in making a Diagonal

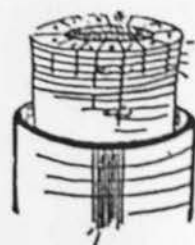


The Central Core and Different Forces

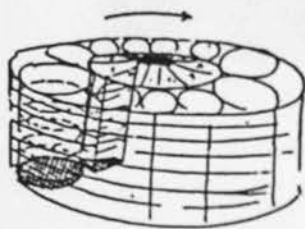
Different Appearances of a Program



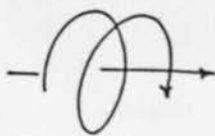
Created Spine by Different Sectoral Axes



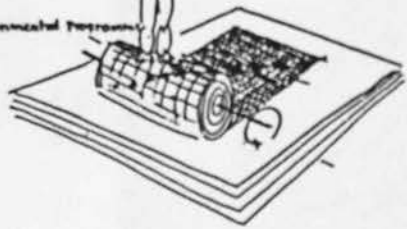
Different Sectors



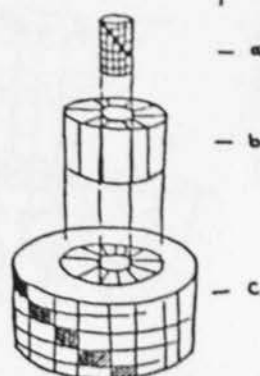
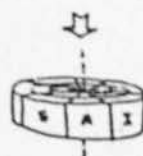
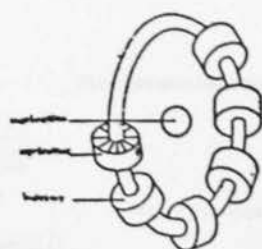
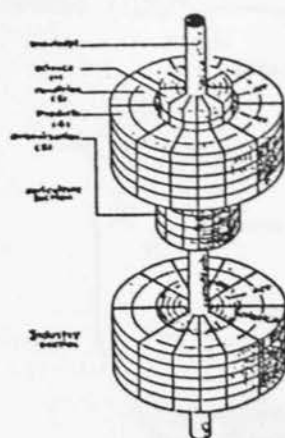
Direct and Indirect Social Relations



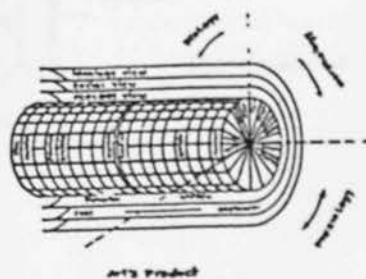
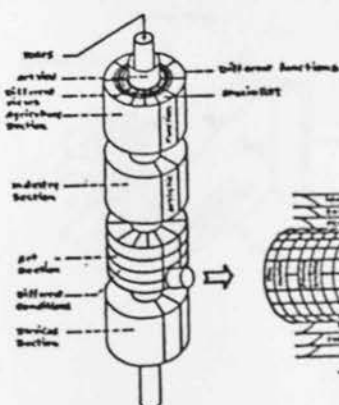
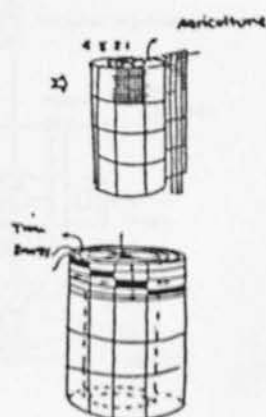
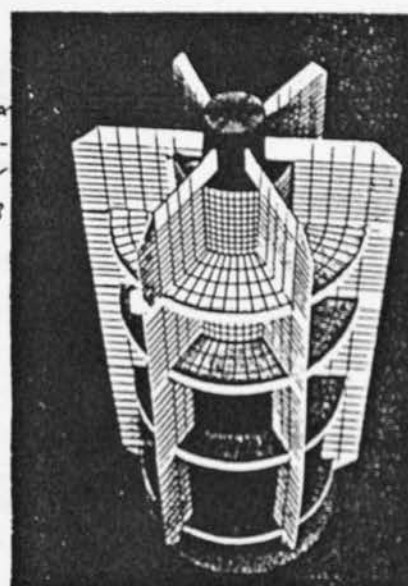
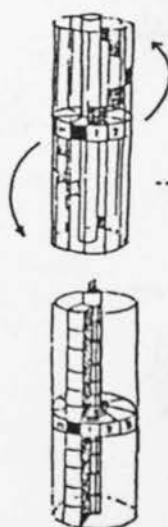
environmental Program



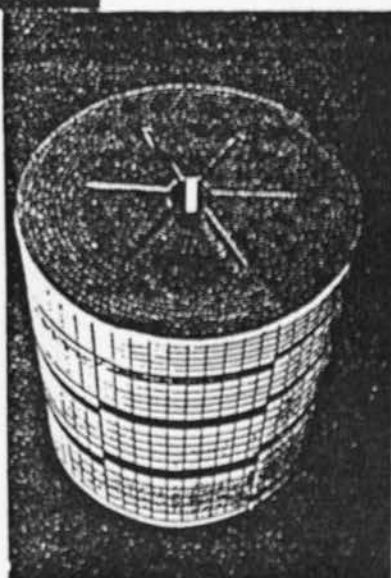
Role of Diagrams (carrying genes) in different Stages of Development Programmes



The Complexity of The products and Their Relationships



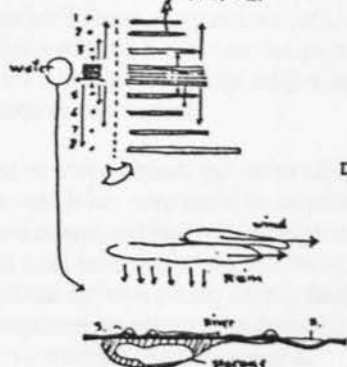
Source: Islami (1983)



Resources → Needs

Process

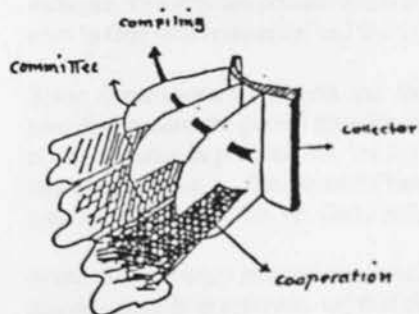
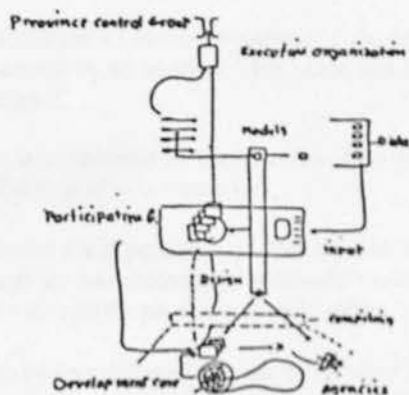
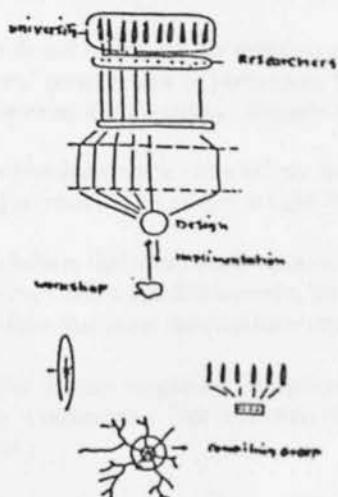
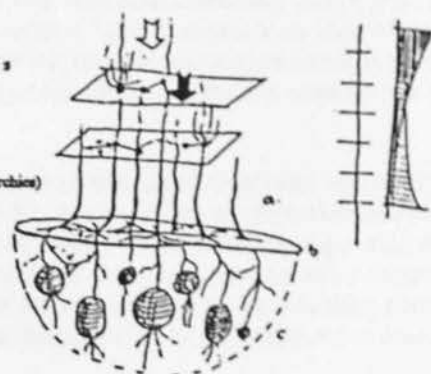
Artificial



Plans & Programmes

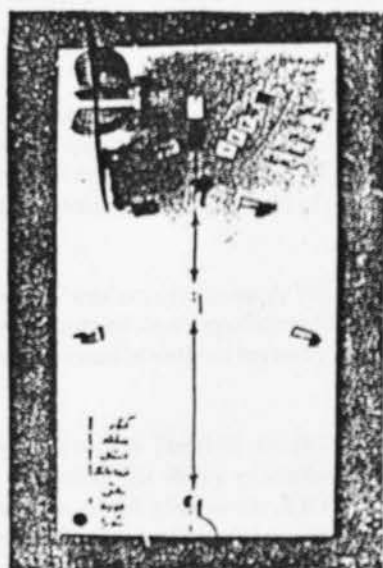
Direct Interaction Model (hierarchy)

sources & Resources



Mediated Organizations

Hierarchical Organization



m) Philosophical Background (Cause and Effect Relationship)

Tabatabaei (1953) tries to shed light on another property of cause-effect relationship and writes that two separate and independent causes cannot affect one effect, and also one cause with one causal relationship cannot affect two effects. There are different interpretations out of philosophy about these rules. Many examples in our daily life show that several subjects work together and cooperate in one action or one subject creates several functions. In the first examples, the few subjects are one subject and the second examples the subject is either few subjects or its few action are seen as one function.

A morsel we eat with our hands and our mouth, a shirt which has been sewed up from the cloth by tailor with his tools, and a door which has been made by carpenter from wood show that new inventions are dependent on several conditions and causes, and their relationships with environment are not similar. For instance, the shape of the shirt depends on both tailor and cloth. But, these relations are quite different from each other, i.e. tailor consumes something from his own (work, action, function) to sew the shirt but the cloth depends on something from its outside (acceptance, reaction) to be formed into a shirt. So, subject has something to give which object does not have it but is potentially ready to accept it.

Following the discussion in 4.B.4.2., Motahhari points out to deterministic relationship of cause-effect and adds: 'This determination is not essential but is rather an exterior constraint.' He also classifies some different attitudes to show their interpretations of the structure of the world and its necessity and writes:

- a) Those who do not believe on the structure of the world and its causal relationship; (who consider the existence and nonexistence of phenomena being caused by an accident. They claim that there is no necessity for being and the causal relationship is wrong.)
- b) Some of the Motekallemine; (who believe that there is no necessity for the structure of the world. They also claim that even if the causality is right, but its determination is wrong.)
- c) Those who believe that effect needs cause in occurrence not in permanency; (they say that not only the structure of the world is not deterministic, but although the determination of cause-effect relationship is true. They claim that cause does not have anything to do with the permanency of the effect.)
- d) Some Oraffas (Iranian religious philosophers); (who believe that existence has no structure by itself to be necessary or unnecessary. That is because existence is a unique fact. This unity is, therefore necessary and essential.)
- e) Some Theologians (Aristotle, Ib'n Sina, and Farabi); (who believe that the universe's structure is necessary because general causality, deterministic cause-effect, and the need of effect to cause in permanence are authentic. This structure consists of essential and nonessential necessity because the hierarchy of causality ends to God who is essential and the main cause.)
- f) Some contemporary scientists and theologians; (who believe that the structure of the existence is necessary because the general causality and deterministic cause-effect are authentic. Although, effect does not need cause in permanence, but the effect remains reflexive and determinable until the presence of cause as a terminator. This structure has essential and nonessential necessity. The hierarchy of causality ends to the first stimulus, i.e. God.) and
- g) Some contemporary materialists. (who believe that the structure of existence is necessary because the general causality is authentic, say that although effects in their permanence do not need causes but their permanence is determinable and reflexive. This structure is entirely formed by exterior necessity because the hierarchy of cause and effect relationship is unlimited.)

Every existing effect has necessarily a final cause. Man's activities also have final causes. The final causes for Man's activities are combination of his instincts, his feelings, his memory, his mind, the ability of evaluation and prediction, and his will. Each activity should have ultimate purposes or at least should adapt to one of his feelings or instincts. If an activity is not useful, his 'will' resists the constraints and push them away. Objects have interaction with their environment. Plants have to adapt themselves to their environment. But, Man has the ability of choosing

his way. He has 'will' to select one way of few ways. So, suspicion is one of his characters to select and choose, and this is because of his constitutional mind. Motahhari (1953) classifies some introductions to human choice as:

1. understanding; [which consists of: a) understanding the deeds (conceiving the deeds) and b) understanding the benefit of the deeds (confirming the final adaptation of deeds to the vital needs of subject).]
2. reaction; (which involves happiness and fear of the results of the deeds.) and
3. action. (which consists of 'will' which is the last stage and cause of choices.)

Following the citations above, Motahhari claims that there is another stage before the stage of 'will'. That is evaluation, comparison, and thinking which help distinguishing him from animal. There is another element involved in Man's thought and that is its ability of realizing his inside and outside worlds.

n) Propensities and Opportunities to Engage in the Process

• Goals and Purposes

Wiener et al. (1943) and Taylor (1950) discussed purpose in cybernetics and talked of the behaviour of a greyhound which adjusted its behaviour as a function of the speed and direction of the mechanical hare it was chasing (George, 1979). The fact that cybernetics goes beyond the human being as a system and considers all sorts of other systems should not conceal the fact that the human being remains the centre piece of cybernetic endeavour. One term should be looked at briefly since it plays a large part in such a system: it is 'purpose'.

If human beings (all organisms) did not have purposes (motives, goals) they would not be able to adapt or to learn. What is required is at least an agreement over usage. Then, it would be possible to say that the behavioural patterns which initiate the simplest goal-seeking activity are instinctive, and may involve what ethologists have called innate releaser mechanisms. Over and above these instincts people have learned activity and, by **secondary motivation**, they built up sets of positive and negative values or subgoals. This happens when there is a need-reduction, in terms of **primary motives**. All the other stimuli take on a positive value when the behaviour leads to success and negative value when it does not.

Primary needs are such as food, drink, etc., therefore, a human being is motivated to eat when hungry. Her/his goal is food. The word 'needs' is a description of basic requirements, 'motives' are roughly synonymous with 'purposes', but not exactly. For example, although one can say that 'her/his motive in driving to Y was to see X' and 'her/his purpose in driving to Y was to see X', but 'motive' is as rather more specific, but only marginally. Therefore, the word 'reason', is often used for 'motive' and 'purpose' in the above statements.

All of this demonstrates that there is a sort of terminological mess surrounding these 'motivational' terms, but it can be at least suggested that people have needs, motives and purposes, and they are attached to primary, secondary, ... even n-ary goals and subgoals which are in the outside world. Whether one wants to say that all behaviour is purposive, or all adaptive behaviour is purposive, is a matter of making a decision over usage. George (1979, p. 91) refers to another problem associated with living systems and claims: "A similar problem arises over predicating 'living' or 'consciousness' of people at any particular time."

The short-term objectives and the tactics to achieve goals come from the practical needs of the local situation, e.g. fixing washing machine in a weekend time. Objectives are not very subjective here! The local situations may arise from broader, longer term, goals and the strategic plan to achieve them, e.g. having a good house with a manageable mortgage. There is a much stronger subjective element at this level. The goals may in turn arise from even broader policies or principles, such as a country's constitution, a committee's terms of reference, or a particular ideological analysis of why things are as they are, e.g. people get what they deserve, so one will have to work hard; then s/he will get that house.

But, these successively broader and more subjective guidelines become harder and harder to convey in words, eventually becoming a barely conscious blend of cultural pressures, and personal attitudes, wishes and perceptions. This forms the 'appreciative system' that generate our values and priorities and the world-view that structures the way that people see things. They often find it hard to recognise these very broad influences at work in themselves until they meet someone with a very different world-view and find that they cannot see eye to eye, with every attempt to communicate leaving them more confused and frustrated. There are many phrases that express the factors

which often people use at work in more positive way and Carter (1984) lists them as followings:

- a) an action that 'looks good' or 'feels wrong';
- b) feeling your attention drawn to some issue;
- c) a hunch or 'gut reaction'; and
- d) feeling that 'the pieces are coming together'.

Where people organise themselves together they have to find ways of harmonising the many individual world-views to coordinate their goals and objectives. The same source lists them:

- a) people may converge on a particular shared direction just by limiting their options; (for example, by knowingly or unknowingly accepting a common culture of shared norms, and by letting someone else tell them what to do: leader, teacher, manager, expert, parent, etc.)
- b) sometimes there is an attempt to synthesize a genuinely shared direction; (for example: by some political procedure, such as a debate followed by a majority vote, by working for mutual understanding so as to maximise consensus and avoid spurious conflict, and by negotiation and bargaining) and
- c) a third option is to find a quantitative way of expressing the aspects of particular actions that matter to people (signs, geometrical or mathematical models, etc.) and what they are with to them. [In theory, people can then calculate rationally the 'best' mix of (pro)s and (con)s. But, putting numbers to subjectives can be very deceptive.]

• Needs and Wants

The relationship of human beings and themselves, human beings and other people, human beings and their environment is concerned with their wants and their needs. The 'want' aspect of motivation is sometimes characterized in terms of levels that are graded from physiological needs to what are called self-actualizing needs (Maslow, 1970). The hierarchical ordering of needs runs something like:

- 1. physiological needs; (such as hunger, thirst, etc.)
- 2. safety needs; (such as security, order, freedom from pain, discomfort and threat.)
- 3. belongingness and love needs; (such as love, sex, affection, friendship, identification.)
- 4. esteem needs; [such as fame, prestige, recognition, success (self-esteem and respect of others)] and
- 5. need of self-actualization. (Man's desire for achievement or self-fulfilment of individual's potential; 'to become everything that one is capable of becoming'.)

This hierarchy appears to span physiological, sociocultural, and personality bases of motivation. In relating needs to an act, the life-sustaining needs of a physiological nature produce what may be regarded as compulsory acts. In this thesis, the concern is primarily with sociocultural bases of need which produce acts of a more voluntary nature, a choice³². In contrast to these kinds of felt need, the 'enjoyment' basis of an activity, which must eventually be incorporated more directly into the framework, would relate to personality and the individual's tastes, talents, creativity and other capacities for responding to a situation.

Conceivably, the '**motivation → choice → action**' sequence could be incorporated into the design and development of a systems framework. Describing the model of activity pattern and availability of a situation, facility, or services requisite for the performance of an activity, Chapin (1974) states that instead of viewing the behavioral sequence entirely as a 'demand' phenomenon, the consummation of an activity is seen to be dependent on a 'supply' consideration as well³³; in other words, reading from right to left, the diagram in Figure A.1.6 illustrates that an activity pattern is contingent not only on a propensity to engage in the activity, but also on there being an opportunity to engage in that activity in the sense that a facility, service, or other means is available which permits the activity to take place.

³² A choice is seen, by Ackoff (1962), to be made in relation to one or more wants, a set of perceived and feasible alternatives for achieving these wants, and the perceived cultural and social context for making the choice, that is the contingencies concerning its environment.

³³ An example would be the new road intended to serve traffic congestion also generates most traffic.

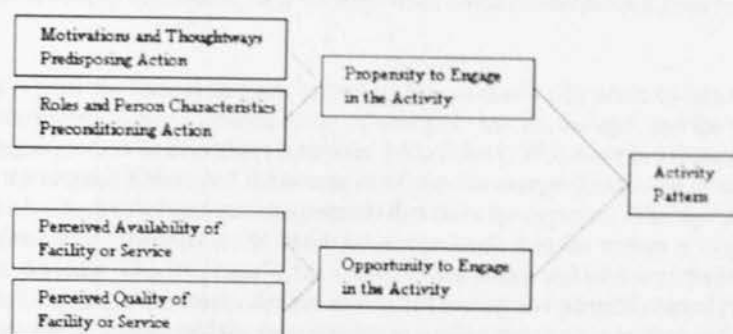


Figure A.1.6 General model for explaining activity patterns
Source: Chapin (1974)

Arranged in order from those of a more compulsory nature to those of a more voluntary nature, the following motivational bases for an activity, derived from the same source, indicate the range of needs which might be said to have a bearing on activity patterns:

1. subsistence needs: a) basis of motivation; (i.e. need for sleep, food, shelter, clothing and health care.) and b) requisite means of satisfying needs; (i.e. institutionalized systems for ministering to basic needs: for example, income-earning opportunities from vocational training, deduction, medical care, social service, etc. These opportunities presuppose economic organization for production and delivery of goods and services and the organization and delivery of other services implicit in the above listing of basic needs) and
2. culturally, socially, and individually define needs: a) basis of motivation; (i.e. felt needs for security, status, achievement, affection, and social contact; outlets for exercise of personal talents, ingenuity, prowess, and skill; need for mental release, for example, the release of feelings of joy, fear, frustration or alienation; and need for physical release for example, physical exercise as well as rest and relaxation.) and b) requisite means of satisfying needs. (i.e. opportunities for seeing kinsmen, friends, neighbours and others; opportunities for participation in church, voluntary organizations, and civic activities; opportunities for creative activity for engaging in recreation and other diversions; and for rest and relaxation.)

People associate, interact, belong; they join, influence, dominate, control, like, love others. Do they have a 'herd instinct' which draws them together? Are there psychic dynamic forces which pull them, or gradually acquired drives they develop for survival purposes? Are there a few basic general drives which energize their behaviour, or a vast number of motivating influences directed towards the satisfaction of their goals? These are some questions to which psychology and evolutionary biology have been reluctant to provide clear answers. Whether the human needs are basically physiological or basically psychological or a fairly even mixture of the two remains ambiguous. The extent to which such needs can be explained in terms of territory alone is also far from settled (Mikellides, 1980).

Darling (1952) in an article 'Social Behaviour and Survival' suggested that the provision of territory satisfies not only our physiological needs but mainly our psychological ones. In this interpretation of territory, the nest site provides for 'security' (as opposed to anxiety) and at the border, the periphery, for 'stimulation' (as opposed to boredom). Ardrey (1967) in his book: 'The Territorial Imperative' added a third need, that of 'identity' (the need of the animal to defeat anonymity and to differentiate itself from all others of its species). He further suggests that these three needs motivate behaviour of all higher animals³⁴, and that there is a definite hierarchy amongst them: identity

³⁴ Mikellides (1980) refers to some psychologists who consider needs in terms of social behaviour, such as Schutz, and propose three basic interpersonal needs that the developing child gradually acquires: 'inclusion' (synonymous to interaction), 'control' (dominance) and 'affection' (love).

is the most powerful, followed by stimulation, then security which could be sacrificed if need be for the sake of the other two.

But, if somebody is to trace the various attempts to explore human needs, s/he needs to turn back to the work of Sigmund Freud who conceived Man as a dynamic system of energies - the 'id', the 'ego', and the 'superego', all three dynamically interacting to produce an individual's behaviour. Mikellides (1980) describes these systems briefly and says that the 'id' is the original system and the source of all psychic energy (libido) out of which the other two evolved. This energy takes the form of unconscious instincts that drive the organism. The 'ego' is the system which deals with the realities of the external world at the conscious level; it is the system of cognitive processes - perceiving, thinking, deciding. The 'superego' is the system of restraining and inhibitory forces acting on our 'id' impulses, such as sex. It expresses the values, rules and morals that society and parental control provide; it becomes our 'conscience'. When the id, the ego and the superego are in conflict they lead to arousal and anxiety, which are dealt with through characteristic 'defence mechanisms'.

By stressing these biological rather than social determinants of personality, Freud stimulated interest in others either to build upon his own theory or to develop alternative theories in an attempt to demolish psychoanalysis. Mikellides (1980) refers to A. Adler, a student of Freud, who stressed the social rather than the biological determinants of personality by arguing that the main source of Man's motivation is his 'striving for superiority' and that all other motives are expressions of this aim: Man's goal is to perfect himself, to compensate for his deficiencies and inferiorities. The same source indicates that similar to this idea, D. McClelland postulates as Man's main driving-force is the 'need for achievement': people behave in a way which shows effort to accomplish something, to do their best, to excel over others. Postulating one or two instincts or needs as basic motivational forces (e.g. Freud's 'libido' or Adler's 'striving for superiority') is an approach that is in direct contrast with the identification of multi-motivational influences by other psychologists such as H. Murray, G. Allport and A. Maslow.

Murray's tentative list of psychological needs or motivational energies published in 1928 gives an idea of their rich variety, though it should be remembered that the relative strength of each need 'as well as their organization' varies from person to person. Allport (in Mikellides, 1980) develops this richness and multiplicity even further, and argues that these forces are limitless in number and variety. He proposes the concept of 'functional autonomy', which maintains that activities serving an original motive may later become 'motivating in their own right'.

Kurt Goldstein (1947), followed by A. Maslow (1954), adopted as Man's main driving-force the idea of '**self-actualization**' developed earlier by Carl Jung - the drive to make actual what is potential in the self, i.e. towards maximum realization of one's potentialities (Mikellides, 1980). By suggesting the model with basically five levels in a hierarchical order which has been cited in the beginning of this section, Maslow believes that there is a 'natural unfolding' of our needs in a gradual and progressive fashion from the 'lower needs' to the 'higher needs'. The individual follows this development as s/he matures ideally arriving at self-actualization. To these five needs Maslow adds the desire to know and understand and the aesthetic need as an afterthought. Once a person is freed from the domination of the lower needs s/he is in a position to allow her/his rich potentialities to flourish - s/he is free to come 'self-actualized'.

Argyle (1967, 1978), a social psychologist from Oxford, takes an intermediate position and offers a provisional list of seven motivational sources of interpersonal behaviour in terms of the goals that are sought in each case. The origins of these drives are to be found both in childhood experience and in innate tendencies. They are:

- a) non-social drives; (which can produce social interaction: e.g. biological drives such as the need for food may lead to various kinds of interaction.)
- b) dependency; (submissive relations towards others who help, guide and protect.)
- c) affiliation; (this refers to friendship, physical contact, and is related to extroversion.)
- d) dominance; (need for power, status, recognition.)
- e) sex; (biological purpose of reproduction; pleasurable end in itself.)
- f) aggression; (to harm other people physically or verbally.) and
- g) self-esteem and ego-identity. (the need for self-evaluation and approval by others.)

Ingrid Gehl (in Mikellides, 1980) in her book *Bo-Miljo (Living Environments)* isolated three different types of needs which, she considered, should be satisfied in living environments:

1. physiological needs of sleep, rest, food, drink, hygiene, sex, light, air, sun;
2. safety needs of general house safety, safety precautions; (avoidance of pollution, noise and accidents, and traffic safety.) and
3. psychological needs of contact, privacy, experience (involving all our senses), activity, play, structuring (to be capable of orientation, to be able to place objects in one's surroundings in relation to oneself), identification (to identify oneself with something in one's environment, to project oneself into it) and aesthetics (to receive stimuli which are considered beautiful).

In order to bring these psychological needs into sharper focus in relation to our living environments, Gehl divided the environment into four components: **dimension, arrangement, location, and sensory stimuli**. She proceeded to show how each psychological need is related to each of these components. For example, with regard to the need for 'contact', the 'dimensions' of the environment (height, width, length) influence the possibilities for contact. Smaller spaces or shorter distances make it easier for people to meet and talk. Secondly, the 'arrangement' of the environment (that is, the objects in it such as beaches, trees, play facilities) may facilitate the satisfaction of contact needs of carefully considered. Thirdly, the 'location' of the environment may facilitate passive contacts leading to friendships as a result of using common pathways or through the orientation of kitchens with regard to semi-private spaces. Fourthly, 'sensory stimuli' from the environment can be used to create contact, as for instance through the sounds of footsteps, voices, music, textured surfaces, colour, etc.

Finally, Gehl considers these psychological needs in relation to different age groups. Very young children up to six years of age have predictable needs, and require both contact with their own families and with other children; they need varied experiences in the physical and social environment and activity involving sensory and motor functions. Old people's needs, on the other hand, are less predictable, and highly variable. Some old people are active and mobile, others very dependent. But, the need for experience and activity is very important with the aged, many of whom spent most of their time in their own neighbourhood. What she suggests is that the environment should allow them to meet young children and relatives.

Lists of psychological needs, such as those mentioned above, are helpful as simple practical guides for checking and identifying needs within the context of a defined problem associated with the cognitive structure of a person. Further research on the relative strength of such needs between cultures could provide useful information leading to greater understanding about the nature of human needs and the ways in which the environment can facilitate and people and experts can participate to process their expression.

o) Historical Background of Production Process

To explain more the concept of the production process relationship, there is evidence showing the changes after Industrial Revolution and emphasize that machine, were thought to be reducible to three basic mechanical elements in machine age: the wheel and axle, the lever, and the inclined plane. Work was similarly analysed and reduced to ultimately simple work elements. The process of doing so came to be known as "work study". Machines were developed to perform as many of these basic tasks as were technologically feasible. Men did those that could not be mechanized. Men and machines were organized into processing networks the apotheosis of which is the mass production and assembly line (Ackoff, 1974).

Mechanization - the replacement of Man by machine as a source of physical work - affected the nature of the tasks left for Man to perform. Men no longer did all the things required to make a product; rather they repeatedly performed simple operations that were a small part of the production process. Consequently, the more machines were used as substitutes for men, the more Men were made to behave like machines. Mechanization lead to the dehumanization of Man's work (Ibid.).

In System Age the doctrine of expansionism brought synthetic mode of thought. The doctrines of expansionism and teleology and the synthetic mode of thought are both the producers and the products of the Postindustrial Revolution. This revolution according to Ackoff's classification (1974), is based on three technologies the first two of which were developed during the (first) Industrial Revolution. One of these emerged with the invention of the telegraph in the first half of the nineteenth century. It was followed by the telephone in 1876 due to Alexander Graham Bell and the wireless by Marconi in 1895. Radio and television followed in this century. Such devices

mechanized 'communication', the 'transmission' of 'symbols'. Since symbols are not made of matter, their movement through space does not constitute physical work.

The second technology emerged with the development of devices that can 'observe' and 'record' the properties of objects and events. Such machines 'generate' and 'remember symbols' that is called 'data'. The thermometer, odometer, speedometer, and voltmeter are familiar examples of observing machines, instruments. In 1937 there was a major advance in the technology of mechanized observation when it 'went electronic' with the invention of radar and sonar in England. Instruments can observe what humans cannot without mechanical aids. But observation, like communication, is not physical work.

The third and key technology appeared in the 1940s with the development of the electronic digital computer. This machine can 'manipulate symbols logically'. It is able to process raw data in such a way as to convert them into usable form, into 'information' and to convert information into 'instruction'. Thus it is both a 'data-processing' and a 'decision-making' (instruction-producing) machine. Technologies of symbol generation, storage, transmission, and manipulation made it possible to mechanize 'mental' work, to 'automate'.

Nowadays, people live in a world of 'global information revolution'. Man has expanded his knowledge in two different dimensions, one global information by using satellite and the other getting access to the information by using cables and computers. These hard wares are based on digital and have created a notion of syberspace. The new generation are unfolded by the structural models which deal with self-regulation, theoretical internally structured, and symbolic, programmed models in terms of mathematical data bases.

p) Good-Centred and People-Centred Organizations

It is realistic to assume that many individuals could ladder down the four stages of the production process and satisfy their different needs. If Man could do all the activities to satisfy his needs individually, he would have made a self-sufficient environment. Having a holistic knowledge of organising all the activities would then help him to predict the future, as a scientific view to each individual activity would solve his technical problems in order to progress his technology. Distinguishing the priority of goals and needs, implementing different concepts and design schemes, manipulating available resources and processing them into new products, he would need the capability and knowledge of doing so (Figure, A.1.7).

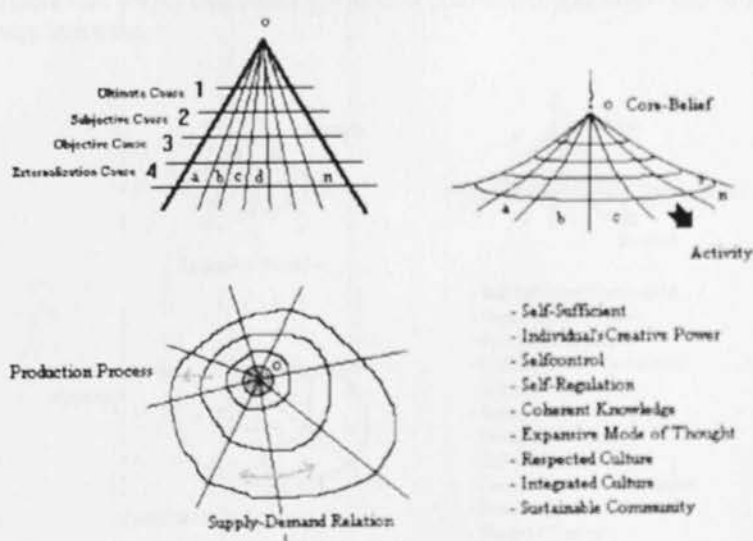


Figure A.1.7 Diversity of the products and unity of the ultimate goals in an individual self-sufficient process

Source: the author

If one feedbacks the process and traces the real cause, s/he will find it conceivable to assume that each cause has an effect and is the effect of another cause. This may shed light into the knowledge about the hierarchy of the causes

and is, of course, a way of analysing things. For instance, Modernism is the cause of special forms in the fabric of a city and the effect of, for example, reconstruction after World War II. The war itself is the effect of many factors. In epistemology (which is concerned about the synchronous and diachronous domains) this is seen as the secondary cause. But, if a person wants to know more about the real cause, s/he should go through the production process back to the ultimate cause in order to bridge the gap between the two domains.

Living in a group in a self-sufficient society helps specification and classification of the activities and creates a communal and social control over the process. More experienced and knowledgeable person is selected as the leader of such communal society dealing with the individual needs in a certain cultural context. This organization, which opens out the opportunity for participating in the process of productions, causes unity of their purposes (goals and values) and diversity of their products (including built environment). Since their lifestyles, therefore their needs and wants, are similar, all the products are distributed by the control of their value-judgement, thus their communal decision making for satisfying the individual needs. This is, of course, guaranteed by their consensus on the rules and values. The exchange of their products with outsiders or within the community obey the same rules which are controlled by a central decision making and communal organization (Figure, A.1.8).

How these values have been created? The definition of any concept remains useless and very abstract. The real meaning of any concept comes from context itself. There is not just one definition for values, as it was discussed before. The real meaning of values is the way cultural group of people see them. They just come out naturally. Different people have different values. There are values which are shared by the whole human beings, but there are values which are specific, to the context, religion, history of each society. These values will lead population to have perception a way of looking at the things totally different from other groups and societies who inherit different influences of their own history. It is not conceivable to say that all human beings have the same values. There is a level in which people share these values. For example, there are different interpretation about the concept of privacy. It has variety of meanings to different people and it is practised and perceived in different ways.

All human beings share the same information processes. They all have the same mechanism. The information they process is different, so they are creating perception. This mechanism of transforming information happen in the mind. They are all the same in all human beings but the origin and the interpretation of things are different. The value, the meaning, the impact of the climate, the impact of familiarity, the history, the religions and all sort of these compacts are actually affecting the brain. The mechanism of transferring the information, the features and characteristic of a place into images into values, the process of transferring an object into value and the diversity of the values are very important.

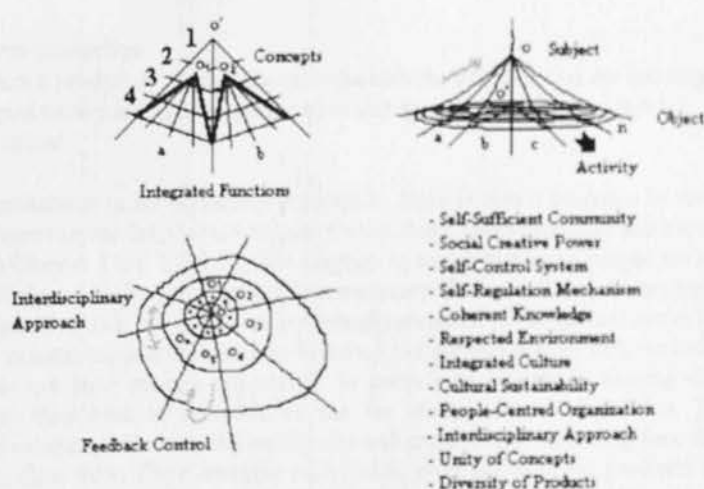


Figure A.1.8 Occurrence of specialisation (O_1, O_2, \dots and O_n)

This is still under control of the central and communal value-judgement in a self-sufficient community.

Source: the author

The model of production process in endogenous development context sees the specification of the works in a way different from reductionism. In indigenous community with self-sufficient economy there is a sense of productivity responsible for structuring the structure of the community's thought, similar to Waddington's (1969) homeorhesis³⁵ in living systems. This holistic knowledge and world view is also undertaking the responsibility of stabilizing and sustaining the community over a long period. Therefore, two centres, O and O', organise all the procedure in both subjective (theological, juridical, political, cultural and theoretical) and objective (economic, environmental and artificial) levels. Through this subjectivity, the relation between each individual activities and others creates an integrated and coherent community. Talbot (1997) pinpoints the same fact by claiming that if there is society as a whole diversity brings unity, but if there is not society as a whole diversity brings chaos and confusion.

Many argue that the process of self-sufficient community is very difficult in today's complex business and industrial organisation. It seems true, because the production process paradigm has been employed for an industrial production which interferes the hierarchy of the production process by concentrating on the end-products. Here, the products which are produced by professionals have central role and the people's needs, without their productive capacities, stands in the periphery (Figure, A.1.9). The model shows that peripheral individuals or societies, as consumers, have only the choice of using the opportunities created by available products. Even though they may be co-producers of a certain product, they do not have the right to influence the procedure of production which is controlling by centralized institutions (monopolies and bureaucracies).

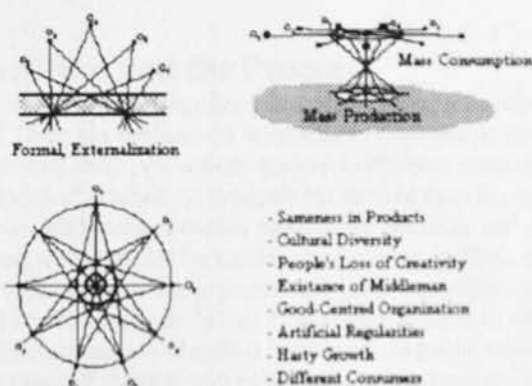


Figure A.1.9 Industrial production

This considers a product as an end, therefore focuses the attentions on the last stage of the production process (formal cause) and causes specification and specialization of the other co-producers' works.

Source: the author

In good-centred organizations or industrialized production, there is also a tendency to diversify the concepts associated with the process to make the products simple, standardized, mass-produced and impersonal (such as the idea of Modernists in Chapter Two: 2.B.1.5.). The diagram in shows that some people are losing their creative power and their knowledge of controlling their needs consciously. Because, their jobs are imposed to them to be able to improve the standard of their lives, they are not actually aware of all the procedures of becoming. They are losing their expertise in some aspects of their lives in the sake of gaining special skills in some specific areas by their works. They do not have enough opportunity to participate directly in making decision about their environment, therefore they have to assemble or use the others' ideas and policies. Therefore, they are gradually being pushed towards abstraction and artificiality and are no longer operating their facts and values into the acts necessary for their lives. Their attempts ends just to progression of the products which is located in synchronous dimension in order to produce typologies of the products (Figure A.1.10).

³⁵ See also the discussion about Homeorhesis and Structural Stability in Chapter Three section 3.B.2.8.

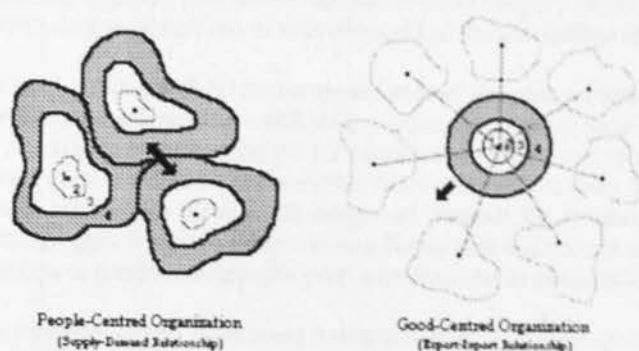


Figure A.1.10 Mutual exchange of self-sufficient communities with one direction and dependent relationship between centre and periphery in good-centred organizations

This creates productive societies with lateral organizations and consumerist societies with central organizations.

Source: the author

q) Productivity Analysis and the Process

The conditions under which productivity is an appropriate framework for evaluating development programmes are as important as the process itself. There is a tendency for the author to emphasis on the production process and its four stages by conducting a discourse about productivity analysis to illustrate some of its applications. There are specific limitations on the application of productivity analyses but three of them are more remarkable: attainment of programme goals; the causal relationship between programme activities and programme outcomes; and programme with the same goals and goal priorities for making comparisons. In effect, there is a critical distinction between two different kinds of programme goals. Some programme goals symbolize the very values and principles of a society. Such goals are ideals to strive for because they present basic notions of what is good and right. These goals are ends in themselves. The second category of goals is more instructional in nature (Patton, 1978). The same source claims that these present a means of attaining more basic ideals, i.e. instrumental goals represent the methods by which higher level ideals are to be achieved.

In evaluation research and policy analysis this distinction between intrinsically valued goals and instrumental goals is critical. The type of goal attainment being evaluated determines the decision context for delineating policy alternatives. This, in turn, has fundamental implications for any research questions to be investigated and any research design to be implemented.

It is clear that a car factory is supposed to produce cars. It is not clear what the outcomes of development is supposed to be. Yet, productivity analysis requires at a minimum that outcomes be clear, specific, and measurable. Given the complexity of most of human activities (agricultural, industrial, and services programme), such clarity and specificity is itself an elusive goal, where evaluators study only those objectives that are measurable, ignoring such difficult outcomes as self respect, social development, independence, problem solving abilities, etc. The evaluation process (inductive reasoning) itself can distract programme accomplishments and misrepresent programme achievements. Because productivity analysis links inputs to outcomes, it is important to know how programme activities are related to programme results.

It is instructive to consider how one might evaluate variety products, for example democracy. Patton quotes from Bachrach (1976), highlighting the evaluation of democracy and finding if it is as an end to itself or is a means to an end, and writes that over the course of the last two hundred years Western political science has become basically elitist because democracy has become to be viewed as only one among many methods of decision-making rather than as an ultimate ideal. He quotes from Schumpeter who says that defined democracy as an institutional arrangement for arriving at political decisions and hence incapable of being considered as end in itself. If democracy is a means to an end, then the efficiency of democracy in attaining that end can be compared to other means. Where the end is defined as getting decisions made, then democracy may well suffer in comparison to more efficient

methods, e.g., elitism, autocracy, oligarchy (see also the discussion about People's Participation in Chapter Two: 2.A). A careful evaluation would then permit one to select the most productive method of making decisions.

After arguing the societal level of decision about the means and ends of democracy, Patton (1978) points out the relevance of it in local programme and says that much federal legislation requires local citizen participation in governing programmes. Actually, in evaluating the people participation components of these programmes, it is critical to know the decision context within which evaluative information will be used. Many questions may be asked which have profound implications for research design and methods, for instance, 'are decision makers interested in knowing whether programme operations are almost efficient with and without active advisory boards - is the relevant policy issue how to generate meaningful people involvement as an end in itself'?

The distinction of the goals is only one among lots of issues involved in evaluating the degree to which social action programmes attain their goals. The evaluators encounter many problems in attempting to identify and clarify programme goals. Those problems are well documented from the experiences of evaluators may be classified as: vague goals; multiple goals; Conflicting goals; central versus peripheral goals; funding goals versus programme staff goals; long term and short term goals; subsidiary goals; appropriate and inappropriate goals; dominal and operational goals; morally putrescent or quintessential goals (Patton, 1978).

Although, Patton is very conscious about the importance of productivity, but it seems that he does not have clear idea about process of productivity. He has argued programmes, goals, inputs and outcomes of the productivity, evaluation and so on. He also believes that productivity analysis links inputs to outcomes and it is important to know the relevance of programme activity with programme results. He says that policy-makers cannot manipulate inputs to achieve greater outcomes if they do not have a clear conception of what the inputs are. Moreover, in open and purposeful systems, production process should be evaluated by a feedback control towards the main goals. So, another cycle of productivity occurs that its products are subjective and gives the knowledge of evolution and progress to the system. This secondary action is as important as the first one, being concerned about the difficulties associated with the notions such as social development, independency, and problem-solving process and the like.

Productivity analysis assumes a direct linkage between programme activities and programme outcomes. It is not sufficient to assume such a linkage. To be meaningful, the relationship between programme implementation and programme outputs must be shown. Until the information showing that the programme is operating is available, according to describable plans, neither outcomes' evaluation nor productivity analyses will be very useful.

If one had to choose between implementation information and outcomes information, because of limited evaluation resources, there are many instances in which implementation information would be a greater value. A decision-maker can use implementation information to make sure that a policy is being put into operation according to its design - or to test the very feasibility of the policy. Unless one knows that a programme is operating according to design, there is no reason to measure its productivity (Ibid.).

In some cases, the means for achieving a goal are known, but the full consequences of implementing those means are unknown. Only by systematically monitoring the impact of the programmes can goal attainment be made predictable over time. Without such predictability, productivity analysis will produce relatively meaningless data for policy and developer makers.

Patton (1978) concludes his discussion about productivity and summarizes it in the Table A.1.1 which indicates that although it presents a considerable simplification of options, it has the essence of the idea that different evaluation strategies are needed for different programmatic condition. For example, under condition where outcomes are predictable but means for achieving those outcomes are not clearly known, a study of the relationship between programme activities and programme outcomes is needed. Sometimes the means for achieving a goal are known, but the full consequences of implementing them are unknown. Here, only by systematically monitoring the impact of activities can goal attainment be made predictable over time. Finally, he describes the fourth cell of the table where goal attainment is ambiguous and cause-effect relationships are unknown and says; "This is a quite typical situation for a host of innovative programmes. Such programmes are struggling to find out what works and what they can accomplish. Process evaluation using qualitative methods is aimed at determining the strengths and weaknesses of programmes so that they can be improved.

Goal attainment	Cause-effect relationships	
	Known	Unknown
Predictable	Productivity analysis appropriate	Study in relation of programme implementation to programme outcomes
Ambiguous	Outcomes evaluation needed	Process evaluation

Table A.1.1 Evaluation Options

Source: Patton (1978)

r) Marx's General Mode of Production

Marx's phrasing is extremely tight and shows a precise schema, which is shown in Figure A.1.11. The essence of this general theory is that human history can be divided into epochs in each of which, Marx (1859) said, it is possible to distinguish a system or social formation with an economic structure 'corresponding to a definite stage of development of (Man's) material powers of production'. He distinguishes 'the Asiatic, the ancient, the feudal and the modern bourgeois modes of production'. Between each of these systems or epochs, his historical studies lead him to see the transformation as a sharp break, a period of social revolution, and from this could therefore be predicted the revolution from the bourgeois mode of production in a capitalist society to a socialized mode of production in a communist society (Marx, 1875).

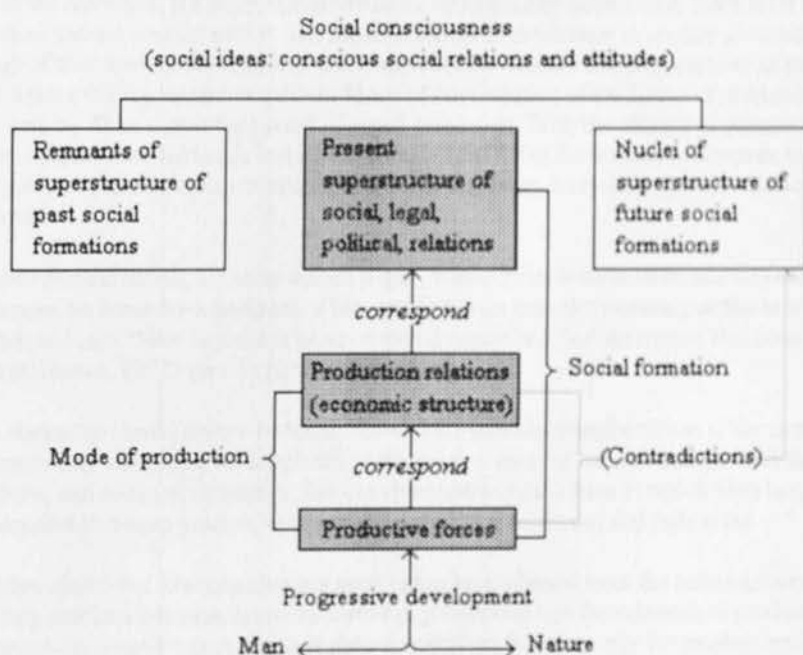


Figure A.1.11 Marx's schema of social structure and development

Derived from O. Lange: Political Economy, p. 33; and Marx: Preface to A Contribution to the Critique of Political Economy.

Source: Brown (1972)

Barratt Brown (1972, p. 124) puts forward his argument about Marx's schema of social structure and development and says: "Marx envisages these epochs as stages in a progressive development just in so far as they represent stages if Man's technological advance, as we should now call it, and this undoubtedly is not linear. He does not

suggest that all societies must go through all the stages, nor that conquest might not disturb the order, but only that the economic structure of any society (the relation of human beings in production) must correspond to its technical process of production. If it does not, 'at a certain stage of their development, the material forces of production in the society come in conflict with the existing relations of production or - what is but a legal expression for the same thing - with the property relations within which they had been at work before.' Then, he compares Marx with his Hegelian predecessors in terms of looking to the changes of their general theories and their direction and says that Marx's general theory was out of changes from below in the material condition of life (synchronous dimension), and not out of changes from above in the so called general progress of mind, that legal relations and form of state (diachronous dimension or above that, i.e. ultimate/final cause) were to be understood. Marx (1867) says, "The mode of production in material life determines the general character of the social, political and spiritual processes of life."

As Figure A.1.11 shows, the base of productive forces to which the economic structure of production relations correspond - these together making up the mode of production and above that a superstructure with corresponding definite forms of social consciousness - the whole constituting a single social formation (Barratt Brown, 1972). If one is going to understand the essence of Marx's general theory, one should determine the meaning of the two words 'correspond' and 'determine'. The same source cites from Marx (1859) who says:

"... In the social production which Men carry on they enter into definite relations that are indispensable and independent of their will; these relations of production correspond to a definite stage of development of their material powers of production. The sum total of these relations of production constitutes the economic structure of the society - the real foundation of which rise legal and political superstructures and to which correspond definite forms of social consciousness."

The line of correspondence in the Marx's general model is upward, but it does not mean that each separate level is determined by the one below. If it were, change would be economically determined. Each level has to correspond with the one below and not conflict with it. The material forces of production in society are always depending and at a certain stage of their development they may come into conflict with the existing relations of production (Barratt Brown, 1972). Marx (1859) goes on to say "from forms of development of the forces of production these relations turn into their fetters. Then comes the period of social revolution. With the change of economic foundations the entire immense superstructure is more or less rapidly transformed." It is the economic structure in Marx's view that is overturned and it is in this structure of property relations that Marx finds the generator of social change - in the struggle of classes.

Criticizing Marx's general model, the same source states: **"Since Man is himself inside any model of the social sciences there must be room for a feedback of his consciousness into the working of the model."** It propounds a critical question and asks: "How then can it be the material conditions that 'determine' this consciousness?" Marx (1859, in Barratt Brown, 1972) goes to provide his answer:

"The distinction should always be made between the material transformation of the economic conditions of production which can be determined with the precision of natural science, and the legal, political, religious, and aesthetic or philosophic - in short ideological - form in which Men become conscious of this conflict [between productive forces and production relations] and fight it out"

Furthermore, Marx claims that this consciousness must rather be explained from the contradictions of material life, from the existing conflicts between the social forces of production and the relations of production. But, Barratt Brown emphasizes on consciousness which is shown as driving from not only the existing social formation, but from the superstructure of past social formations and quotes from Lange (1963, p. 33), whose schema is reproduced by the Figure A.1.11, called "the nuclei of superstructure of future social formation". This last is fed into the diagram by a broken line reflecting the appearance of contradictions between the existing economic relations and the development of productive forces. The feed back of consciousness is derived from the conflict. It is by their understanding of these new forces and by their control over them that a new class of Men became historically agent of social change (Ibid.).

Within Marx's (1867) general theory and at the heart of it, beside his predictions of the future course of social change, there is the economic structure whose transformation can be determined with natural science. He writes

in the preface of the Capital that "the ultimate of his work was to lay bare the economic law of motion of modern society." These laws then are independent of the will of individuals. He says: "My standpoint is one from which the evolution of the economic formation of the society is viewed as a process of natural history." In his general theory Marx seems to be reflecting Darwin's thought. Just as species cannot survive unless adapted to their environment, so societies cannot develop without adapting the relations of production the forces of production. In his model of the economic structure Marx seems to be following Newtonian concepts (Barratt Brown, 1972). He then quotes two examples from Capital volume one (1867) and writes: "In the form of society now under consideration, the behaviour of Men in the social process of production is purely atomic." And "as the heavenly bodies, once thrown into a certain definite motion, always repeat this, so it is with social production."

What is clear in Marx's general model is that the present superstructure of social, legal, political, relations of the society which causes social formations concerning productive forces has more correspondence with 'mode of production.' It means that its location in the suggested model is after production process and reflexive which is the characteristic of the consumer societies. But, in a productive society this superstructure (ultimate cause) is the main stimulus of progressive development and the start point of production process which makes the society active. Although, there is no significant visible component in the Marx's general model of production process, but one may conceive it by mode of production, correspondence of productive forces and production relations. If one applies the thesis's suggested production process in Marx's Mode of Production, s/he will consider the social relations and attitudes as social consciousness in stimulating the production process.

s) Endogenous Growth

Romer's (1986) paper, 'Increasing Returns and Long Run Growth', proposes a model where economic growth (identifiable by supply-demand paradigm and synchronous dimension) is driven by the accumulation of knowledge (identifiable by production process and diachronous dimension). He is arguing that **knowledge is the basic form of capital**. Later he identifies the differences between knowledge and physical capital and says:

- a) the development of new knowledge comes with diminishing returns; (even though some people pour money into research, they will not come out with identical products. Where they can buy a factory and that produces 10 widgets a day, they can not buy a team of researchers and get 10 developments a year. And the more money they pour into research, the less they may get back.)
- b) investment in knowledge leads to increasing returns in marginal products: (If a team of researchers designs a prototype for the perfect widget, their factories can produce them, and they will sell thousands of them for the cost of the one development which put them ahead of the competition.) and
- c) investment in knowledge has a 'natural externality' - that is, knowledge cannot be perfectly patented or kept secret. (Once one knows that something can be done, s/he can start trying to duplicate it. And new knowledge has a positive effect on the production possibilities of other firms.)

But, 'endogenous growth' does not just happen. There are a few preconditions. As Romer writes in his 1990 paper, 'Endogenous Technological Change', the model of endogenous growth has 4 basic inputs:

1. capital; (measured in units of consumption good)
2. labour; (skills available from a healthy human body)
3. human capital; (activities such as formal education and on-the-job training. This is person-specific: if the person, who knows how to multiply, dies, that skill is lost from the pool of human capital.) and
4. an index of the level of the technology.

The key point in above model is an adequate stock of human capital. In page 98, he finds that "what is important for growth is integration not into an economy with a large number of people but rather into one with a large amount of human capital." This is important for countries to note, in setting up political and economic agendas. His conclusion is that, to promote growth, countries' economic policies should:

- a) encourage investment in new research; (as opposed to encouraging investment in physical capital accumulation.) or, if (a) is not possible, at least
- b) subsidize the accumulation of total human capital. (Problem with this one is that multi-national parachute use the local human resources and human capital, but spirit their capital out of the country into safer tax havens, not investing the money back into the country. What countries need to do, We (1994) suggests, is to build regulatory frameworks to collect 'rent' for the building of human capital from the multi-nationals.)

What was interesting to We (1994) in Romer's (1990) paper, which is more an overview of the origins of endogenous growth, is the five facts:

1. there are many firms in a market economy;
2. discoveries differ from other inputs in the sense that many people can use them at the same time; (**Knowledge is a non-rival good** - this means to the same source that if you know how to add and I know how to add, we can both add at the same time. A calculator, on the other hand, is a rival good because we cannot use the same one at the same time.)
3. it is possible to replicate physical activities; (Because knowledge is non-rival, many calculators can be made from the one principle of adding machines- and lots of other electrical engineering, too, but that has another problem which is discussed before.)
4. technological advance comes from things that people do; (This one sounds strange, but it has based on the fact that things just do not happen because another year has gone by. That is more like the exogenous growth of a tree - another ring. What Romer is saying here is that technological advances come when people start experimenting or looking for market niches. The users' role in controlling the market economy has been discussed previously in Section 2.B.1.1. of Design Process in Chapter Two.) and
5. many individuals and firms have market power and earn monopoly rents on discoveries. (This fifth one which some theorists have implied is that it is probably a good thing for some countries to let the property rights slide for a few years, so that a country can catch up, and then put them in place to protect their developments. A similar thing happens with copyright in many developing countries.)

A country would want to limit imports of foreign goods because locally produced goods allows them to keep the money from their companies in their country - not flowing to a foreign country. This can be done through import restrictions and tariffs, or by selectively weaken intellectual property rights so that foreign rights are undermined and domestic rights are preserved (Rivera et al., 1991). Following their discussion they set up a controlled and simplified thought experiment to test trade and technological development between two countries, which together make up the 'global' market. They set up three scenarios, with different levels of trade restrictions and intellectual property rights:

1. designing a new good and earning monopoly rents in the world market;
2. copying a good from abroad that is not allowed to enter the domestic market, and earning monopoly rents from the domestic market alone; and
3. copying a good that is already being sold in the domestic market and playing a duopoly game.

However, if the barriers are too high, and new inventions cannot cross the national lines, then the incentive to innovate decreases, and worldwide technological progress slows down. Basically, they find that any barriers on trade slows down worldwide technological growth. Also, as they put it, copying is a tax on the revenues that a copy makes, and reduces the amount of human capital that could be used more productively (i.e. innovating). On the other hand, if companies in both countries A and B innovate, there are greater spin off benefits (knowledge spill overs) for both countries, and greater overall economic development for the global economy. **What countries have to do is find growth through balancing innovation and copying; tariffs and free trade; incentives to trade**

barriers to discourage external goods. That is what, We (1994) says endogenous growth is all about.

There are some researchers doing work on how to encourage endogenous technological growth. The same source believes that a lot of this work is remarkably post-Fordist in character. For example, the paper 'The New Age of Capitalism: Innovation-Mediated Production' by Richard Florida and Martin Kenney, is describing a system of mass production which uses decentralized decision making, and uses the knowledge and intelligence of all employees, making daily learning important. Here is a quote from a steel factory worker in the paper, in page 638, mentioned by We (1994): "Before we came to work we used to check our minds at the factory gate. Now we are the source of innovation." Florida and Kenney identify 5 major dimensions in innovation-mediated production:

1. a shift in the main source of value creation from physical skill or manual labour to intellectual capabilities or mental labour;
2. the increasing importance of social or collective intelligence as opposed to individual knowledge and skill;
3. an acceleration of the pace of technological innovation;
4. the increasing importance of continuous improvement at the point of production; and
5. the blurring of the lines between the laboratory and the factory.

Basically, what they are describing is the model of production in a post-Fordist era. In order to stay competitive in an era of constant change, companies have to use all the resources available. They describe a steel factory where production time was cut down from 12 days to one hour, and the quality of the steel produced was improved tenfold - primarily because of a drastic change in production methods, changes in workers' attitudes to work, and a constant improvement policy.

There is also a utopian stream of thought with these new developments. That workers are able to use their minds as well as their brawn in good, but the authors also offer hope of developing countries - in the model of Romer's work. Because this new model of development gets workers involved in production, increases the human capital, and develops more innovation. As Florida and Kenney write in page 650 of their paper, innovation-mediated production is good for developing countries because "this new model of development does not require huge investments in technology. Even if a country or firm has limited resources to invest, ..., shopfloor workers comprise a crucial source of innovation and improvement. Thus, every nation and every firm have assets for innovation, which can be unleashed if their human resources are cultivated and managed properly. A key factor in future development strategy will be the ability of these nations to adapt key aspects of innovation-mediated production and develop both the manufacturing and human infrastructures required to support it." This ties to Romer's thesis, that countries need to be in control of their own development, so that they can function in the new information economy.

APPENDIX TWO (The Questionnaire)

a) Some Notions in Quantitative and Qualitative Research

• The Nature of Quantitative Research

Quantitative research is associated with a number of different approaches to data collection. The social survey is one of the main methods of data collection which embodies the features of quantitative research. The survey's capacity for generating quantifiable data on large numbers of people, who are known to be representative of a wider population in order to test theories or hypotheses, has been viewed, by many practitioners, as a means of capturing many of the elements of a science. Most survey research, Bryman (1988, p. 11) says, "is based on an underlying research design which is called '**correlational**' or '**cross-sectional**'. This means that data are collected on a cross-section of people at a single point in time to discover the ways and degrees to which variables relate to each other."

Quantitative research is a type which uses a special language which indicates some similarity to the ways in which scientists talk about how they investigate the natural order - variables, control, measurement, experiment. In addition, "as social scientists have been looked to increasingly by governments and other agencies to provide policy-relevant research, they have either been compelled to adopt a supposedly scientific approach or have sought to display an aura of scientific method in order to secure funding." In order to examine the precise nature of the scientific method that forms the foundation of quantitative research, it is worthwhile to have a brief review of positivist position in research (Ibid.).

The Positivist Position

One of the difficulty associated with 'positivism', in the literature, is its wide range of meanings. Different versions of positivism can be found. Bryman (1988, p. 15) claims: "Even when there is a rough overlap among authors on the basic meaning of the term, they rarely agree precisely on its essential components." What, then, is positivism? He answers:

- a) positivism involves a belief that the methods and procedures of the natural sciences are appropriate to the social sciences; [This view involves a belief that the objects of the social sciences, i.e. people, is not an obstacle to the implementation of the scientific method. This position is often referred to as the principle of 'methodological monism' or 'methodological naturalism'. (von Wright, 1971; and Giedymin, 1975)]
- b) positivism involves a belief that only those phenomena which are observable, i.e. sensible, can be warranted as knowledge; (This means that phenomena which cannot be observed either directly through experience and observation or indirectly with the aid of instruments have no place. This aspect of positivism is often referred to as the doctrine of 'phenomenalism' and sometimes as 'empiricism'.)
- c) positivism suggests that scientific knowledge is arrived at through the accumulation of verified facts. (These facts feed into the theoretical formation. Thus, theory expresses and reflects the accumulated findings of empirical research. Such findings are often called 'laws', that is empirically established regularities. The notion of science and in particular scientific theories is often referred to as the doctrine of 'inductivism'.)
- d) scientific theories are seen by positivists as providing a background of the empirical research in the sense that hypotheses are derived from them which are then submitted to empirical test; (**This implies that science is 'deductive', in that it seeks to extract specific propositions from general accounts of reality.**) and
- e) positivism is also often taken to include a particular stance in relation to 'values'. (This notion can be described in clarification of positivism in two senses. The first is the more obvious sense of needing to cleanse a scientist of values which may damage her/his objectivity and so undermine the validity of

knowledge. The second aspect of positivism's posture on values is to draw a sharp distinction between scientific issues and statements on the one hand and normative ones on the other. Positivism denies the appropriateness of the sphere of the normative to its purview because normative statements cannot be verified in relation to experience. While positivists recognize that they can investigate the implications of a particular normative position, they cannot verify or falsify the position itself.)

From the above citation, there are many points about these principles which are worth mentioning. Principles (b) and (d) together imply that there is a difference between theory and observation. Empirical verification is taken to involve devising observations which are independent of scientific theories and see neutral. **Secondly, principles (c) and (d) in conjunction seem to imply that science is both an 'inductive' and 'deductive' activity** (see the discussion about inductive, abductive and deductive in Section 4.B.3. of Chapter Four, i.e. Logical Thinking and the Process). **This view suggests a circular process by which hypotheses are deduced from general theories and submitted to empirical test; the subsequent results are, then, absorbed into the general theories.** Thirdly, the importance of phenomenalism implies that observations are the final arbiters of theoretical disputes, and therefore generates a view which changes theoretical reasoning to a minor role (Alexander, 1982). This tendency is further underlined by the doctrine of 'operationalism', which is generally associated with a positivist position and in particular can be viewed as a ramification of phenomenalism. Operationalism seeks to remove the ambiguity in the concepts that are embedded in scientific theories by specifying the operations by which they are to be measured (Bryman, 1988).

Positivism and Quantitative Research

Quantitative research is often conceptualized as having a logical structure in which theories determine the problems to which researchers address themselves. It is in the form of hypotheses derived from general theories. These hypotheses are assumed to consider causal connections between the concepts which are the elements of the hypotheses. Because concepts in the social sciences are believed to be abstract, there is a need to provide operational definitions to be measured. Data are collected by a social survey, experiment, or one of the other methods. Once the survey or experimental data have been collected, they are then analysed so that the causal connections which are specified by the hypothesis can be verified or rejected. Then, the findings which are resulted feed back into, and are absorbed by, the theory that set the whole process. It conceives of quantitative research as a rational, linear process. Figure 6.2 captures some of the chief components of the typical account of the quantitative research process (see also Figure 3.A.1 in Chapter Three).

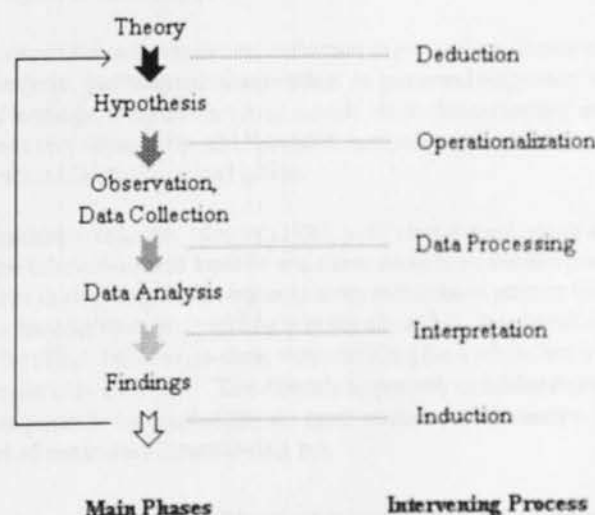


Figure A.2.1 The logical structure of the process of the quantitative research [adopted to Bryman 1988]

The problems with this view of research process which is commonly encountered the logic of quantitative research is bringing a number of defects. First, it exaggerates the centrality of theory in much quantitative research, while, by no means all quantitative research is theory-driven in this way. The latter term was devised by Merton (1967), who sought to bridge the gap between grand theories (e.g. functionalism, conflict theory) and low-level empirical findings. Since grand theories were so abstract they offered few values as to how they might offer guides to empirical research; by contrast, much research in sociology and in psychology deemed to offer little prospect of absorption into wider theoretical schemes. Middle-range theories were proposed to mediate these two levels of discourse by dealing with 'delimited aspects of social phenomena' (Merton, 1967). The role of theory is seen to follow inductively as its product or summary rather than preceding research as its subject or organiser (Warshaw, 1975). Further problem with this idealized model derives from its apparent linearity and orderliness.

• The Nature of Qualitative Research

When one speaks of 'quantitative' or 'qualitative' methodologies, s/he is in the final analysis speaking of an interrelated set of assumptions about the social world which are philosophical, ideological, and epistemological. They encompass more than simply data gathering techniques (Rist, 1977). The methods of data collection with which qualitative research is associated have been employed by social scientists for many years. The best-known of these methods has been referred to as 'participant observation', which includes the sustained involvement of the researcher among those whom s/he seeks to study with a view to generating a rounded, in-depth account of the group, organization, or whatever (Bryman, 1988).

The debt owed by participant observers and qualitative researchers in general to anthropology can be distinguished in the widespread use of the term 'ethnography' to describe their approach, a term coined in the context of anthropology to represent precisely, an anthropologist's picture of the way of life of some interacting human group (Wolcott, 1975). The existence of such studies implies that qualitative research is not a new tradition and has methods of data collection with which it is most closely associated. These methods have been summarized by Griffin (1985) as followings:

1. Participant Observation; (which is probably the method of data collection.)
2. Unstructured Interviewing; (in which the researcher provides minimal guidance and allows considerable freedom for interviewees.)
3. Life History Method; (that has become a highly prolonged unstructured interview in which the researcher induces others to reflect at length about their lives and the changes and processes which underpin their experiences.) and
4. Group Discussion Methods. (Which were loosely structured around a series of key topics and questions to allow for a degree of flexibility.)

Stating the differences between the methods of data collection in psychology, Banister et al (1994, p. 3) pinpoints the fact that '**discourse analysis**', '**participant observation**' or '**personal construct**' work, for example, may only produce redescriptions of language, social interaction or the self, while '**interviewing**' and '**ethnography**' will touch upon and change a person or a community, and '**feminist**' methodology and action research will always involve reflection and transformation of experience and action.

To signify the nature of qualitative research, Measor (1985, p. 67) has argued one of the properties of this method and writes: "Inevitably, the interviewee will 'ramble' and move away from the designated areas in the researcher's mind. The interviewee in rambling is moving onto areas which most interest him or her. The interviewer is losing some control over the interview, and yielding it to the client, but, the payoff is that the researcher reaches the data that is central to the client. I always go along with rambling for a while, but try to make a note about what is missed and cover it in the next interview." **The thesis's approach to understand people's central views of change in their lives was possible by conducting an open-ended questionnaire. Many attempts have been made to make it a kind of controlled interviewing by:**

- a) **having a session with each individual; (this was before interviewing, to introduce the main objectives of the research and the different concepts of the topic, which usually continued for more than half an hour.)**
- b) **asking questions about the theme (development and change) from different angles; and**

- c) pursuing the reasons of their responses. (This helped the author to ladder down to the deeper part of their unconscious knowledge and understanding of the subject.)

In addition, the author is coming from the same case and acted spontaneously as a friend or neighbour. So, his familiarity with the place and the subject, which people had been asked about, had an essential role in controlling the rambles to keep their concentrations and focuses on the central issues. To reflect the various activities in the field study, which the author was engaged in as participant observer, a citation quoted from Gans (1967, p. 440), who was doing research on a suburban community in the USA, is worth mentioning. This defines the author's role in this research, which can be seen as 'total participant', considering the style of the questionnaire, which is open-ended, and shows three types of research roles:

"These activities cast me in three types of research roles: 'total researcher', 'researcher participant', and 'total participant'. As a total researcher, I observed events in which I participated minimally or not at all, for example, as a silent audience member at public meetings. As a research-participant, I participated in an event but as a researcher rather than as a resident, for example, at most social gatherings. As a total participant, I acted spontaneously as a friend or neighbour and subsequently analyzed the activities in which I has so participated."

The Characteristics of Qualitative Research

The most fundamental characteristic of qualitative research can be categorized, according to the Bryman's (1988) classification, as:

1. **Seeing through the Eyes of the People;** (which is the strategy of the qualitative research to view events, action, norms, values, etc. from the perspective of the people who are being studied.)
2. **Description;** (which is one of the main purposes of ethnographers' research style for providing detailed of the social settings which they investigate.)
3. **Contextualism;** (which is almost inseparable from another theme in qualitative research, namely 'holism' which intend to examine social entities as wholes to be explicated and understood in their entirety. Events are understandable only when they are situated in the wider social and historical context.)
4. **Process;** (which is both a symptom and cause of an undertaking to view social life in processual, rather than static terms. Participant observers have been very attuned to the notion of viewing social life as involving interlocking series of events and so tend to place a much greater emphasis on the changes that the processes, which provide its bedrock, are responsible for inducing.)¹
5. **Flexibility and Lack of Structure;** (which is the strategy of qualitative research and is relatively open and unstructured, rather than one which has decided in advance precisely what ought to be investigated and how it should be done. Qualitative researcher tends to the view the open approach, which allows her/him access to unexpectedly important invisible topics, as a way to help recognizing the irrelevance of the research question from within the framework of the community and the ability to change direction in the formulation of her/his problem.) and
6. **Theory and Concepts.** (This is an approach to help qualitative researchers to be mistrustful of their specification prior to the start of the research enterprise. This is not to say that a method like participant observation is incapable of testing theories and allowing concepts to be operationally defined at the outset of a qualitative study.)

¹ The qualitative researcher is in a better position to view the linkages between events and activities and to explore people's interpretations of the processes in social life. The influence of perspectives like Phenomenology, symbolic interactionism, and naturalism led qualitative researchers to suggest that 'we cannot take for granted, as the natural scientist does, the availability of a preconstituted world of phenomena for investigation' but must 'examine the processes by which the social world is constructed' (Walsh, 1972).

In regard to the above classification, the main objective of the thesis, by propounding an open-ended questionnaire, is to pursue people's vision of development and changes of their lives, the ways they confront the problems and the different ways of conducting their solutions. Proposing the more specific classification for the people's responses, four functions have been adopted to this end: 'description'; 'explanation'; 'simulation'; and 'evaluation'.²

In descriptive kind of investigation, attention is, usually, directed towards identifying similarities and differences in activities exhibited by a population under study and among various subsocietal segments in this population. In the explanatory type of investigation, the concern is with factors postulated as having an influence in shaping these activities. The descriptive and explanatory stages are seen as a pre-analysis or preprocessing phase prior to the development of a system's approach and structural approach, which would come into play in the simulation stage of research and development and eventually in testing planning and policy proposals in the evaluation stage. Simulation encounters formidable problems in projecting activities into the future. Even simply redistributing the present population to a rearranged spatial structure of built environment poses some kinds of uncertainties in connection with moving behaviour.

The analysis of the questionnaire is concerned not only with how people live (i.e. description), but also with what factors assist them to have that life style (i.e. explanation). As brought out in previous paragraphs, descriptive and explanatory approaches are essential steps in developing a capability to simulate activities, which in turn is a step that helps using time and spatial measures of human activity in the evaluation of their social systems. The explanatory model, thus, serves as a diagnostic tool for pinpointing variables that then become parameters in the simulation of activities.

Problems in Qualitative Research

A number of problems in the implementation of qualitative research have been addressed in its three central facets: the problem of interpretation, i.e. the ability of the investigator to see through other people's eyes and to interpret events from their point of view; the problem of the relationship between theory and research, which qualitative researchers tend to support; and the problem of generalization, i.e. the extent which qualitative research, deriving from case studies, can be 'generalized'.

The Problem of Interpretation

Ball's (1984) justification for giving less emphasis to non-academic facets of school life is worth mentioning. He says that access to a world of fleeting, overlapping, contradictory, murky, incoherent realities demands selective attention from the field worker. For everything that is noticed, a multitude of other things are forgotten. There is also a tendency towards a descriptive approach to the use of 'data' in relation to conclusions or explanations in qualitative research.

A more fundamental difficulty with respondent validation is the nature of the linkage between the ethnographer's data (i.e. interpretations of her/his subjects' world-views) and the elaboration of those data for presentation to an academic audience. As anthropologists like Geertz (1973) recognize, **ethnographers are engaged in interpretations of other people's interpretations**. It is unlikely that respondent validation will greatly facilitate the ethnographer's second-order interpretations of subjects' first-order interpretations (Bryman, 1988). Bryman suggests that the presentation of the natives' point of view can be viewed as containing three components:

1. the way in which the natives view the world;
2. the ethnographer's interpretation of how they view the world; and
3. the ethnographer's construction of her/his interpretation of the natives' view of the world for the ethnographer's own intellectual and cultural community.

Regarding to the proposal cited above, some treatments have been conducted for the questionnaire so far. First, all

² Chapin (1974) has also used these terms in his general model for explaining human activity patterns. See also Section (b) of this appendix for more definition about them.

the responses and reasons have been brought into consideration in this research in order to consider the aim of principle (1), without considering the number of times they have been repeated by people. This help keeping the potential of the people's view and preparing an opportunity for the other researchers, who have different interpretations, to follow the work. The second principle is used to validate the data by classifying and accumulating them. **The procedure of classification starts from the questions and ends to the analysis of data. Here, the author's interpretation is descriptive dealing with the statistical responses; explanatory dealing with responses which identify 'present states'; simulative dealing with those which intend to state the 'desire', the changes or the 'future plan' of the people; and eventually it is evaluative confronting the answers with references to the 'impact' of the other systems.** These four stages have been also used by the interviewees to reflect their interpretation of their lives. To compare the result of collected data with the principles embedded in the hypothesis, the element (3) was under consideration. So, a language is constructed to translate people's views of their lives to those who are familiar with language of the thesis. **Then, for the purpose of interpreting people's interpretations, four principles of the 'production process', which is one of the endogenous development's paradigms, have been employed as criteria to evaluate and to analyse the data (see Figure 6.1).**

The Problem of the Relationship between Theory and Research

The outline of theoretical ideas is usually viewed as a phase that occurs during or at the end of fieldwork, rather than being a start to it. There are different approaches to the qualitative researcher's view of the linkage between theory and investigation. One of the most frequently cited is 'analytic induction', a term which was coined by Znaniecki (1934)³. The basic sequence of procedures is outlined in Table 6.1.

Chief Steps

- a) rough definition of the problem;
 - b) hypothetical explanation of problem;
 - c) examination of case(s) to determine fit with hypothesis;
 - d) if lack of fit, either (1) hypothesis is reformulated or (2) problem re-defined to exclude negative case;
 - e) hypothesis is deemed to be confirmed after a small number of cases has been examined: (negative cases require further re-formulation.) and
 - f) procedure continues until no further negative cases have been encountered and a universal relationship has been established.
-

Table A.2.1 Steps in analytic induction [derived from Bryman (1988)]

To the analysis of data, analytic induction is an approach in which the occurrence of a single negative case is sufficient to send the researcher off to reformulate the problem. Another way in which the relationship between theory and data in qualitative research is often formulated is in terms of '**grounded theory**', an approach which draws on some of the basic components of analytic induction. To identify the historical root of the idea of grounded theory Bryman (1988) asserts that it was first formulated by Glaser et al. (1967) as a means of generating theory which is embedded in data. Turner (1981) has compiled a sequential series of stages which provide the chief components of grounded theory:

³ See also the discussion about deduction, abduction and induction in Chapter Four, Section 4.B.3., i.e. Logical Thinking and the Process. In that section, the author referred to Peirce (1923) who believes that there is only one form of analytic reasoning: the deductive and there are two forms of synthetic reasoning: the inductive and the productive (abductive). There is also a logical explanation for these which has been illustrated in Figure 4.B.1 of the same section.

- a) after some performances to the field setting and some collection of data, the researcher starts to develop **'categories'**; **(which illuminate and fit the data well. In this regard, home, quarter, town and general aspects are proposed to form a category.)**
- b) the categories are then **'saturated'**; (meaning that further instances of the categories are gathered until the researcher is confident about the relevance and range of the categories for the research setting. There is a recognition in the idea of 'saturation' that further search for appropriate instances may become a superfluous exercise.)
- c) the researcher then seeks to abstract a more general formulation of the category, as well as specifying the criteria for inclusion in that category; **['statistic', 'present state', 'future plans' (i.e. desires, plans and changes) and 'impact' are categories of this kind employed in the present questionnaire].**
- d) these more general definitions then act as a guide for the researcher, as well as stimulating **further theoretical reflection**; (this stage may assist the researcher to think of further instances which may be subsumed under the more general definition of the category.)
- e) the researcher should be sensitive to the connections between the emerging general categories and other milieus in which the categories may be relevant; **[e.g. in the field survey, questions about development (which are categorised in a part related to 'future plan' and 'simulation') help searching the mechanism of growth from within, from deep structure into surface structure. This is similar to function of the production process].**
- f) the researcher may become increasingly aware of the connections between categories developed in the previous stage, and will seek to develop hypotheses about such links.
- g) the researcher should then seek to establish the conditions in which these connections pertain **[description, explanation, simulation and evaluation have been conducted to provide such conditions.]**
- h) at the point mentioned above, the researcher should explore the implications of the emerging theoretical framework for other, preexisting theoretical schemes which are relevant to the substantive area; **[ultimate cause, subjective cause, objective cause and formal cause, the stages of the production process paradigm, are the preexisting theoretical schemes in the survey which aim to test the implication of the emerging theoretical framework of the research.]** and finally
- i) The researcher may then seek to test the emerging relationships among categories under extreme conditions to test the validity of the posited connections.

Thus, theories are derived from the field-work process refined and tested during field-work and gradually elaborated into higher levels of abstraction towards the end of the data collection phase. This approach allows theory to emerge from the data and provides a framework for the author to cope with the unstructured complexity of social reality and so make it manageable; and it allows the development of theories and categories which are meaningful to the subjects of the research.

Case Studies and the Problem of Generalization

Some writers treat 'qualitative research' and 'case study research' as more or less synonymous terms. For many commentators, this reliance on a single case poses a problem of how far it is possible to generalize the results of such research. But, It is conceivable to help obtaining generalization of findings by study more than one case, through the examination of a number of cases by more than one researcher, whereby the overall investigation assumes the framework of 'team research'; and to seek a case which is 'typical' of a certain cluster of characteristics (Woods, 1979, p. 268), other researchers can then examine comparable cases which belong to other clusters of characteristics (Bryman, 1988).

The discussion of the connection between theory and research indicates that analytic induction and grounded theory have provided qualitative researchers with possible frameworks for attending to

theoretical issues. There is a growing view that qualitative research ought to be more consciously driven by theoretical concerns, in contrast to the belief that theoretical reflection ought to be delayed until a later stage in the research process (Ibid.). This has been applied in the model used in this research (see Figure 6.1).

• **Contrasting Dimensions of Quantitative and Qualitative Research**

Some main contrasting features of quantitative and qualitative research are listed in Table 6.2 which shows eight important dimensions of divergence between the two research traditions.

		Quantitative	Qualitative
1.	Role of Qualitative Research	Preparatory	Means to Exploration of Actor's Interpretations
2.	Relationship between Researcher and Subject	Distant	Close
3.	Researcher's Stance in relation to Subject	Outsider	Insider
4.	Relationship between Theory/Concept and Research	Confirmation	Emergent
5.	Research Strategy	Structured	Unstructured
6.	Scope of Findings	Nomothetic	Ideographic
7.	Image of Social Reality	Static and External to Actor	Processual and Socially Constructed by Actor
8.	Nature of Data	Hard, Reliable	Rich, Deep

TableA.2.2 Some differences between quantitative and qualitative research [derived from Bryman (1988)]

It is common to conceive of the quantitative/qualitative dichotomy in terms of respective commitments to 'nomothetic' and 'ideographic' modes of reasoning (Halfpenny, 1979). This distinction effectively refers to the scope of the findings which derive from a piece of research. A nomothetic approach seeks to establish general law-like findings which can be deemed to hold irrespective of time and place; an ideographic approach locates its findings in specific time-periods and locales. Treating the two research traditions as being strictly associated with nomothetic and ideographic findings has been also called a cautionary matter. **Although the questionnaire used in this thesis has benefited from a mix of both qualitative and quantitative traditions, but its scope of finding is based on the nomothetic reasoning. This is perhaps because of the nature of the thesis which is not problem oriented, therefore the findings of the case studies are established to test the hypotheses.**

• **Approaches to Blending Quantitative and Qualitative Research**

Quantitative and qualitative research in some treatments are as competing views about the ways in which social reality ought to be studied. They are said to be the essentially different clusters of epistemological assumptions of what should pass as guaranteed knowledge about the social world. For some writers, quantitative and qualitative research are representatives of different ways of conducting social and psychological investigations. They are appropriate to different kinds of research question and even as capable of being integrated. When this second view is taken, they are more or less different approaches to data collection, so that, preferences for one or the other are based on technical issues. In this view, the prime consideration is to adjust the appropriate technique to a particular research question.

There are also a number of ways in which qualitative research can solve the problems and develop the instruments for quantitative research. Qualitative research may act as a source of hunches or hypotheses to be tested by quantitative research. Qualitative research may also facilitate the construction of scales and indices for quantitative

research. The presence of qualitative data may greatly assist the analysis of quantitative data (Bryman, 1988).

Qualitative research presents a processual view of social life, whereas quantitative research provides a static account. The attribution 'static' may be taken to have negative connotation, but this need not be so. By adopting a static view, much quantitative research can provide an account of the regularities, thus patterns of structure, which are a feature of social life.

As Silverman (1985, p. 140) has put it, 'The critical reader is forced to ponder whether the researcher has selected only those fragments of data which support his argument.' He argues that the use of 'simple counting techniques' allows the qualitative researcher to survey the bulk of her/his data and to provide the reader with an overall impression of those data. Further, Silverman argues that the exercise may greatly benefit qualitative researchers themselves in that they may come to revise their understandings of their data when 'simple counting' reveals that their impressions were mistaken. He, then, encourages to count the countable preferably in terms of the categories actually used by the participants. This can be a good evidence for dividing the responses into **statistical, present states, future plan and impacts** which have different natures.

There are differences between quantitative and qualitative research, about the kinds of data that each engenders and the levels of analysis at which each operates. Therefore, each has its own strengths and weaknesses. The suggestion that quantitative research is associated with the testing of theories, whilst qualitative research is associated with the generation of theories, can be viewed as a convention that may have little to do with either the practices of many researchers within the two traditions or the potential of the methods of data collection.

b) Different Approaches to the Study of Urban Structure

Chapin (1974), describing 'community', brings quotations from Berry (1972) who proposed it as 'daily urban system', from Friedmann (1973) who conceived it as 'urban field' and from Webber (1964) who described it as 'urban realm'. He, then, states that research and development focused on human activity systems in the metropolitan community are viewed as offering an important approach to the study of urban structure, certainly in a spatial sense but possibly in a social sense as well. Chapin suggests four stages for this kind of effort:

1. Description; (which is a phase for studying of patterned ways different subsocietal segments of the metropolitan community use the city, its facilities and its services.)
2. Explanation; (which is a study of the factors that appear to regulate activity patterns thus described.)
3. Simulation; (that is the development of a model capable of reproducing activity patterns.) and finally
4. Evaluation. (A phase in which the simulation model is used to investigate the likely impacts on human activity of the implementation of various alternative plans and policies.)

There are applications of these phases in built environment and development process. The descriptive and explanatory phases provide the planners and designers with a means for understanding the ways people deal with their environment; they give a conceptual view of the rhythm and the spatial locus of life. They provide a basis for identifying and understanding the diversity in activities of the population to different life styles. There is also a key area of application that comes directly out of the first two phases and is concerned with the development of models of physical and spatial structure and studies of the dynamics of change in the spatial organization of the built environment. A second area of application comes out of the next phases of an research and development effort and is concerned with simulation, then the application of time allocation in the evaluation of the social efficiency of planned changes in the spatial organization of the built environment.

Even though there are serious problems in projecting social activities into the future and sustain the process of life, simulative models are assumed, by Chapin (1974, p. 17) and the author, to serve a useful purpose in the analysis of existing spatial structure and in evaluating the social efficiency of one change introduced in the existing order of things over other alternative changes. Analysing activities response to physical changes in spatial organization, it can be anticipated that the simulation-evaluation stages will yield a method of making 'social impact' studies (see Figure 6.1 in Chapter Six).

c) The Questionnaire

Questionnaire
People's participation in designing their environment
(Endogenous Development)
1995

General description of responder

Code No:

Name (no obligation):

Interviewer:

Age: Sex:

Date of interview:

Occupation:

Time start: Time end:

Educational status:

Place of interview:

Address:

.....

.....

.....

1- Which kind of family do you have?

a. nuclear

b. extended

2- How many people live in your family?

1- Sex: Age: 2- Sex: Age: 3- Sex: Age:

4- Sex: Age: 5- Sex: Age: 6- Sex: Age:

7- Sex: Age: 8- Sex: Age: 9- Sex: Age:

3- Do you have a house or houses of your own? Yes/No.

4- What is the nature of the ownership of your house?

5- How long have you been in your present house?

6- How long do you expect to stay at your house?

7- Mention (3) reasons why you have chosen this current house?

1)

2)

3)

8- Mention (2) important changes happened after moving to this house with regard to facilities, opportunities, the neighbourhood, jobs, etc.

a.

b.

9- Mention (3) aspects you do not find satisfactory in your present house. Please give (1) reason for each.

a. 1)

- b. 1)
- c. 1)

10- Mention (3) things make you satisfied with your house. Give (1) reason for each.

- a. 1)
- b. 1)
- c. 1)

11- Have your children secured house for the future? Yes/ No How was this possible?

.....

12- Have you made any changes in your house? Please give (2) examples and (1) reason for each.

- a. 1)
- b. 1)

13- Mention the (2) most preferable things you would like to have in your house. Give (1) reason for each.

- a. 1)
- b. 1)

14- Do you think there is any possibility for people to build their own houses without the help of the local municipality? Yes/No Please mention (2) ways of achieving this.

- a.
- b.

15- Which type of houses do you most prefer? Please give (2) reasons. Type:

- 1)
- 2)

16- Would you like to design your house yourself or ask others to do it? Please give (2) reasons why.

Answer:

- 1)
- 2)

17- Has your choice of present house had any impact on your job? Yes/No Positive/Negative Please give (2) examples.

- a.
- b.

18- Is your work far from your house? Yes/No Please give (2) reasons why.

- 1)
- 2)

19- Are people involved in production of housing? Yes/No Please give (2) reasons for your response.

- 1)
- 2)

20- Do you feel that your house can resist disasters (earthquake, floods, war, ...)? Yes/No Please give (2) reasons.

- 1)
2)

21- Mention (3) things people or the authorities usually do during disasters.

- a.
b.
c.

22- Mention (3) important ways which help towards having a house.

- a.
b.
c.

23- Mention (2) things you like in your neighbourhood and give (2) reasons for each response.

- a. 1)
2)
b. 1)
2)

24-Mention (2) things you do not like in your neighbourhood and give (2) reasons for each response.

- a. 1)
2)
b. 1)
2)

25- Mention (2) things you would like to have in your neighbourhood.

- a.
b.

26- Do you like to be aware of the events happening in your neighbourhood? Yes/No Please give (2) examples how to achieve this.

- a.
b.

27- Do you prefer to live in a neighbourhood where your wider family live? Yes/No Please give (2) reasons why.

- 1)
2)

28- Did you choose your neighbours? Yes/No Please give (2) reasons why.

- 1)
2)

29- Does your neighbourhood have positive aspects of the past that you like? Yes/No Please give (2) examples.

- a.
b.

30- What are the (2) most important buildings in your town? Please give (1) reason why they are important.

- a. 1)
b. 1)

31- Mention (2) buildings you do not like in the town. Please give (1) reason why you do not like it.

- a. 1)
b. 1)

32- What are the (2) most important areas in your town? Give (2) reasons why they are important.

- a. 1)
..... 2)
b. 1)
..... 2)

33- Mention (2) areas you would like to live in your town. Give (2) reasons why you like to live there.

- a. 1)
..... 2)
b. 1)
..... 2)

34- Mention (2) areas in your town you do not like to live in. Please give (1) reason why you do not like to live there.

- a. 1)
b. 1)

35- Mention (2) building materials you like to see being used in the buildings of your town. Please give (1) reason why you like it to be used.

- a. 1)
b. 1)

36- Mention (2) building materials you do not like to see being used in the buildings of your town. Please give (1) reason why you do not like it.

- a. 1)
b. 1)

37- Mention (2) important features you like which have been made in the past of the town. Please give (2) reasons why they are important.

- a. 1)
..... 2)
b. 1)
..... 2)

38- Mention (2) events or changes you would like to see in your town in the future. Please give (1) reason why you would like to see them.

- a. 1)
b. 1)

39- Mention (2) changes which have been occurred in your town which you like. Please give (1) reason why you like them.

- a. 1)
b. 1)

40- Do you think the growth of your town had depended on imported materials and technology? Yes/No Please give (1) example.

- a.

41- Do you think you and people have enough local resources or means for changing your urrounding? Yes/No Please give (2) reasons for your response.

- 1)
2)

42- Mention (2) most important things people do usually in their everyday life which give your town its character. Please give (2) reasons why they are important.

- a. 1)
..... 2)
b. 1)
..... 2)

43- Where do you usually go for shopping? Please give (2) reasons why you go there.

- 1)
2)

44- Mention (2) items you prefer to buy because they are produced in your community.

- a.
b.

45- Mention (2) items you prefer to buy because they are produced somewhere else.

- a.
b.

46- Mention (3) important things that give identity to the old part of your town. Please give (1) reason why they are important.

- a. 1)
b. 1)
c. 1)

47- Mention (2) ways the new generation can know about present values of life.

- a.
b.

48- Mention (2) things you would like the formal education to give to you or people.

- a.
b.

49- Mention (2) important cultural or social features in your town that are useful to people. Please give (2) reasons why they are important.

- a. 1)
..... 2)
b. 1)
..... 2)

50- Please give (2) advantages of traditional architecture.

- a.
b.

51- Please give (2) disadvantages of traditional architecture.

- a.
b.

52- Please give (2) advantages of new architecture.

- a.
b.

53- Please give (2) disadvantages of new architecture.

- a.
b.

54- Identify (2) external things imposed on the city which you do not like. Please give (1) reason for each.

- a. 1)
b. 1)

55- Mention (2) things you think will give long term life to the town. Please give (1) reason for each.

- a. 1)
b. 1)

56- Mention the best way you think which can bring people together to help each other. Please mention (1) advantage of them.

- a. 1)

57- Would you like to talk more about your house, neighbourhood, town and your role in designing and shaping the environment?

.....
.....
.....
.....
.....
.....

Thank you very much for your help in completing this questionnaire.

PLEASE REMEMBER THAT THIS QUESTIONNAIRE IS FOR RESEARCH PURPOSES ONLY AND ANY INFORMATION PROVIDED WILL REMAIN CONFIDENTIAL.

d) The Responses to the Questions

• Present State (Satisfaction, Problems)

Responses to question numbers: 9, 10, 23, 24, 30, 31, 32, 37, 42, 43, 46, 49, 50, 51, 52, 53

Total	Positive Meaning	Negative Meaning
26	rich zone 26	
25	hospital 21	hospital 4
25	Mosque 25	
24	neighbours 17	neighbours 7
23	bazaar 23	
20	infrastructure 2	infrastructure 18
19	school / college 19	
18	new town 14	new town 4
16	park 11	park 5
13	privacy 5	privacy 8
13	old buildings 6	old buildings 7
12		weak against disasters 12
12	adaptation 9	adaptation 3
12	street 12	
12	electric post 6	electric post 6
12	shortage of space 7	shortage of space 5
11	firmness 11	
11	courtyard 11	
10		big towers 10
10	monuments 10	
10	narrow allies 9	narrow allies 1
10	old square 10	
10	despatch 6	despatch 4
10	factory 2	factory 8
9	shopping centre 7	shopping centre 2
9	quarter shops 9	
9		being expensive 9
8	health 5	health 3
8	quietness 8	
8	weather 8	
8	cemetery 2	cemetery 6
8		prison 8
8	old castle 8	
8	Moharam Ceremony 8	
7	wasted land 5	wasted land 2
7	beauty 7	
7	services 2	services 5
7	oldness 7	
7	good region 7	old building 7
7		
7	stylish 7	
6	museum 6	
6	library 6	
6	quarter 6	
6	garden 6	
6		children's noise 6
6	closed alley 3	closed alley 3
6	old town 6	
6		busy quarter 6
6	stadium 6	
6	ownership 6	
6		crowd 6
6		apartment 4
5	countryside 5	
5	apartment 1	
5	square 5	
5	palace 5	
5	airport area 5	
5	cooperation 5	
5		traffic jam 5
5		clay 5
5		public affairs 5
5	city centre 5	
5	traditional style 5	
5	Islamic style 5	
5	going to work 5	
5	accessibility 5	
5	rivers 3	river 2
4	security 3	security 1
4	university campus 4	

a quarter 4	
government offices 4	
one story 4	neighbour's house 4
dam 4	interruption 4
brick 4	
ritual celebration 4	
business area 4	
covered bazaar 4	
kindness 4	oil town 4
kitchen 4	residential tower 4
market 4	
largeness 4	cement factory 4
convenience 4	
cleanliness 3	
railway 3	wall in front 3
castles 3	
respect 3	unemployment youth 3
universities 3	cars 3
purity 3	culture 1
culture 2	
shops 3	being insight 3
rush hour 3	
bazaar (covered) 3	dependency 3
wind-catcher 3	no relationship 3
near garden 3	dirtiness 3
diversity 2	diversity 1
domes 3	transport 3
garage 3	
near Mosque 3	grass market 2
memorial (past) 3	low light 3
people 3	humidity 1
grass market 1	insects 2
Hossainieh 3	lodges 3
humidity 2	lack of cellar 3
insects 1	interference 3
standing at an angle to the street 3	no identity 2
identity 1	queues for bus 2
shrine place 2	queues for shopping 2
	on the south 2
old garden 2	similarity 1
similarity 1	old bath 2
separate families 2	
open spaces 2	restaurant- 2
small windows 2	oil company 2
regularity 2	not updated 2
people's close relation 2	not high enough ceiling 2
	periphery 2
previous square 2	police station 2
north location 2	noisy 2
saving material 2	
port 2	no bath inside 2
adequate 2	
new materials 2	
new technology 2	

allies (with stone floors) 2
Telecabin 2

Islamic loan 2
high roof (dome) 2
high light 2
greenery 2
green region 2
town centre 2
going to Mosque 2
gathering in afternoon 2
tranquillity 2
families' parties 2

economic concern 2

two stories 2

constant 22
cold stores 2
cities gates 2
cinemas 2

cheap material 22
castle (Arg) 2
near work 2
near relatives 2

welfare 2

bank 2

strong foundation 2
old city gates 2
people's unity 2
less energy consumption 1
less noise 1
old ice-house 1
large space 1

local society 1

stranger in group 1
sport 1
Jamá Pray 1

local charity 1
socialization 1
Interior design 1
social discipline 1
out of sight 1

independency 1

Imam Committee 11
housing imitation 1

historical 1
local clothes 1
local material 1

harmonized features 1
harmlessness 1
handicraft 1
greeting 1
local cooperation 1
old trees 1
participation 1
people's feeling 1
good light 1
low rent 1
good methods 1
good vision to outside 1

limited facilities 2
lack of shops 2

masonry 2
execution square 2

deep well 2

court of justice 2
more choice to repair 2

multi-jobs 2
municipality 2
wooden doors 2

bus station 2
brick-kiln 2

wet foundation 2

Azadi monument 2

lack of experts 1
lack of cooperation 1

lack of new technology 1

thick walls 1

thick foundation 1

immodest modernism 1
social security 1

small stairs 1
thin walls 1

high density 1
high walls 1
too much land 1

going to school 1	
old cemetery 1	low density 1
magnificent inside 1	
tradition 1	
garden in court 1	
people's religion 1	
fresh weather 1	
few stories 1	
marriage 1	fanatic people 1
personal arrangement 1	
extra space 1	
maximum use of land 1	extensive 1
entrance 1	
travelling 1	energy consumption 1
educated people 1	
economic centre 1	
easy to build 1	oil institution 1
play ground 1	place for animals 1
	dishonour 1
plentiful 1	discord 1
trees 1	
present quarter 1	
Tehran's water 1	
	darkness 1
dairy market 1	public bath 1
custom office in Khoramshahr 1	
cultural centre 1	
Tehran University 1	
covered path 1	
purity outside 1	
shopping after work 1	
more space 1	
court 1	separate toilet 1
council's market 1	
cooperative shops 1	
urban discipline 1	
cool inside 1	
radio station 1	
more closer 1	
comfortable 1	
colour 1	
collective work 1	
Moslems 1	
	vast spaces 1
civility 1	railway station 1
visual pleasure 1	villagers 1
reading Quran 11	teenagers 1
	motorcycle 1
centrality 1	sympathy 1
water cistern 1	changeability 1
my quarter 1	
recreation places 1	
celebration 1	
relatives 1	
supermarket 1	
revival of character 1	
carpet 1	
sensitivity 1	weakness 1
bridge 1	not repairable 1
Norouz new year 1	
self sufficient 1	
greybeard 1	
birthday celebration 1	
big family 1	
weekend picnic 1	
belief 1	

1	being active 1	
1	neatly things	
1		safety 1
1	bedroom 1	
1		need more time to clean 1
1	Saghakhaneh 1	
1	wide street 1	
1	basement 1	
1		neglecting past 1
1		bad taste 1
1		bad shape 1
1		no choice 1
1	attractive for tourists 1	
1	saving money 1	
1	network of streets 1	
1	allies (covered) 1	
1	all facilities in one story 1	
1	women's veils 1	
1	agriculture 1	
1	administration offices	
1	streets (with stone floor) 1	
1	wooden beams 1	
1	saving time 1	

Table A.2.3 Positive and negative responses to the questions which have been classified as 'present state'

• Future Plan (Desire, Intention, Expectation, Preference)

Responses to question numbers: 6, 13, 15, 16, 21, 25, 26, 27, 33, 34, 35, 36, 44, 45

Total	Positive Meaning	Negative Meaning
24	courtyard 24	
18	brick 12	brick 6
18	others 18	
17	present area 16	present area 1
17	helping 17	
17	northern part of Tehran 16	northern part of Tehran 1
16	cooperation 16	
16	people's help 16	
16	cement 4	cement 12
15		southern part 15
14	Mosque 14	
14	clay 6	clay 8
14	brick (3 cm) 14	
14	north east of Tehran 14	
13	dairy products 13	
12	infrastructure 12	
12	main street 10	main street 2
11	bazaar (covered) 11	
10	kitchen 10	
10	stone 10	
10	marble 8	marble 2
9	well informed 9	
9	sympathy 9	
9	green areas 9	
9		cars 9
9	foods 9	
8	centre 3	centre 5
8	eastern part of Tehran 6	eastern part of Tehran 2
8	myself 8	
8	aluminium 6	aluminium 2
8	clothes 8	
8	home equipments 8	
7	iron 1	iron 6
7	rituals 7	
7	carpets 7	
6		plaster 6

6		
6	garden 6	black stone 6
6	glazed tile 4	glazed tile 2
6	bread 6	
6	electrical instruments 6	
6	kenitex 4	kenitex 2
6	security 6	
5	shelter 5	
5	regularity 5	
5	old town 2	old town 3
5	information 5	
5	grass market 1	grass market 4
5	electronics 5	
5	small town 5	
4	fruits 4	
4		sun-dried brick 4
4	reconstruction 44	both parties 4
4	old centre 4	
4		apartment 4
4	expansion 4	
4	iron beams 4	
4	privacy 4	
4	face to face relationship 4	
4		asphalt 4
4	iron skeleton 4	
4	social security 4	
4	meat 4	
4		concrete 4
4		plaster of clay 4
3	pool 3	
3	local associations 3	
3	wooden windows 3	
3	making budget 3	
3	wooden doors 3	
3	public services 3	
3	new organizations 3	
3	saffron 3	
3	unique culture 3	
3	medicine 3	
3	first aids 3	
3	north west of Tehran 2	north west of Tehran 1
3	bedroom 3	
3	mobilization 3	
2	large guest room 2	
2	ceramic 2	
2	future plan 2	
2	gable roof 2	
2	country side 2	
2	charities 2	
2		prefabricated plaster 2
2	shopping 2	tar 2
2		
2	reinforced concrete 2	
2	necessary equipment 2	
2	old house 2	
2	shrine 2	lime 2
2		
2	small house 2	
2	old garden 2	
2	telephone 2	
2	small industries 2	
2		timber 2
2		intervention 2
2	previous one 2	
2	toilet outside 2	
2	cultural centre 2	
2		wood 2
2	Arg (castle) 2	
2	other cities 2	
2	curing 2	
2	tranquillity 2	

2		
2		small windows 2
2	parking 2	
2	river 2	
2	carpets by machine 2	
2	irony windows 2	
2	coloured glass 2	
2	fast access 2	
2	quarter 2	
2	decoration 2	
2		Isogam 2
2	Mobarakeh Isfahan 2	
2	south port 2	
2		sand 2
2	celebration 2	
2	school 2	
2		periphery 2
2	searching 2	
2	hospital 2	
2	more come and go 2	
2	specialists 2	
2	controlling problems 2	
1	being flat 1	
1	vegetable 1	
1	Hossainieh 1	
1	duty 1	
1	separation 1	
1		railway station zone 1
1	square 1	
1	belief 1	
1	earthenware 1	
1	water cistern 1	
1	identity 1	
1	sharing 1	
1	belonging 1	
1	museum 1	
1	plentiful 1	
1		in the queue 1
1	change of walls 1	
1	large living room 1	
1	old cemetery 1	
1	politic	
1	shopping centre 1	
1	independency 1	
1	natural relation 1	
1		west 1
1	books 1	
1	library 1	
1	wide street 1	
1		Ekbatan towers 1
1		administration offices 1
1	chocolate 1	
1	lift 1	
1	covered alley 1	
1	Tehran's water 1	
1	wind catchers 1	
1	cities gates 1	
1	God's help 1	
1	creation 1	
1	reinforcing 1	
1	neighbours 1	
1	inns 1	
1	crowd 1	
1	rescuing 1	
1	magazine 1	
1	crystal 1	
1	cleaning materials 1	
1	windows 2	
1	oldness 1	
1		residential tower 1
1	small wall 1	
1	building materials 1	

1	network of streets 1	
1	cloth 1	
1	township 1	
1		public bath 1
1	butchery 1	
1		new towns 1
1	bank 1	
1	collecting lodges 1	
1	grocery 1	
1	palace 1	
1	by women 1	
1	barberry 1	
1	trees 1	
1		fashion 1
1		worker's place 1
1	habitat 1	
1	dam 1	
1	purity 1	
1	basement 1	
1	two stories 1	
1	dates 1	
1	handicraft 1	
1	parks 1	
1	workshop 1	
1	socialization 1	
1	participation 1	
1	Saghakhaneh 1	
1	health 1	
1	quietness 1	
1	it is good 1	
1		different zones 1
1	fish 1	
1	radio and T. V. 1	
1	unity 1	
1	beauty 1	
1	Karaj town 1	
1	universities 1	
1	disorderly 1	
1	fresh weather 1	
1	radio station 1	
1	consulting 1	
1	being brave 1	
1	utilizing 1	
1		down town 1
1	friendship 1	
1	railway 1	

Table A.2.4 Positive and negative responses to the questions which have been classified as 'desires'

• Future Plan (Plan)

Responses to question numbers: 7, 11, 14, 19, 22, 28, 47, 48, 55, 56, 57

Total	Positive Meaning	Negative Meaning
38	people's participation in production 38	
29	I have chosen my neighbours 4	I have't chosen my neighbours (25)
23	council's design 23	
21	saving 21	
18	bank's loan 18	
16	government's aids 16	
12	mass media 12	
11	good location 11	
7	local societies 7	
7	parents 7	
7	relative's help 7	
7	having land 7	

7	more work 7	
7	heritage 7	economic reasons 7
7	schools 7	
7	housing cooperations 7	
6	near relatives 6	
6	education 6	
6	population control 6	
6	small and sufficient 6	
5	more schools 5	
5	Mosques 5	
5	cooperations 5	
5	court 5	
5	cheap 5	
5	future plan 5	
5	tranquillity 5	
4	largeness 4	
4	near centre 4	
4	high culture 4	
4		no choice 4
4	two stories 4	
4	expansion 4	
4	libraries 4	
4	good salary 4	
4	convenient 4	
4	books 4	
4	radio, TV 4	
4	building materials 4	
4	free education 4	
3	changing 3	
3	accessibility 3	
3	near work 3	
3	health 3	
3	less streets 3	
3	more facilities in educational sector 3	
3	less cars 3	
3	audio-visual facilities 3	
3	contentment 3	
3	good neighbours 3	
3	quietness 3	
3	parent's help 3	
3	participation 3	
3	families parties 3	
2	patience 2	
2	architects 2	
2	celebrations 2	
2	more trees 2	
2	may God help us 2	
2	less expectation 2	
2	stylish 2	
2	employment 2	
2	right classes 1	
2	practical knowledge 2	
2	right rules 2	
2	old generation 2	
2	friends 2	
2	adding one story 2	
2	extra classes 2	
2	mortgages 2	
2	cheap zones 2	
2	P.T.A. relationships 2	
2	more knowledge 2	
2	colleges 2	being homeless 2
2	giving responsibility 2	
2	society 2	
2	motivation 2	
2	infrastructure 2	
2	tradition 2	
2	right education 2	
2	communication 2	
1	river in Mobarakeh 1	
1	investments 1	
1	life experience 1	
1	ceremonies 1	
1	healthy school 1	
1	support 1	
1	less faults 1	
1	protecting nature 1	
1	cheerfulness 1	
1	militaries 1	

1	comparison 1	
1	water supply 1	
1	less energy 1	
1	cultural centres 1	
1	giving identity 1	
1	low rent 1	
1	social courses 1	
1	need of permission 1	
1	my help 1	
1	near school 1	
1	power 1	
1	strong buildings 2	
1	factories out of city 1	
1	no institution 1	
1	Jama Pray 1	
1	agriculture 1	
1	sympathy 1	
1	natural facilities 1	
1	computer facilities 1	
1	places for sports 1	
1	wisdom 1	
1	more parks 1	
1	familiarity 1	
1	green spaces 1	
1	four-study 1	
1	shortage of space 1	
1	having home 1	
1	indirect education 1	
1	air filtering 1	
1	instalments 1	
1	knowledge 1	
1	God knows 1	
1	cultural associations 1	
1	sports 1	
1	teaching people 1	
1	new architecture 1	
1		no hope 1
1		borrowing 1
1	good teacher 1	
1	decentralization 1	
1	an opportunity 1	
1		moving 1
1		foreign language 1
1	construction 1	
1	stop growing 1	
1	traffic control 1	
1	friendship 1	
1	handicraft 1	
1	more control 1	
1		they should go 1
1	emigrant control 1	
1	people's representative 1	
1	productivity 1	
1	density 1	
1	self education 1	
1	universities 1	

Table A.2.5 Positive and negative responses to the questions which have been classified as 'future plan'

• Future Plan (Changes)

Responses to question numbers: 8, 12, 20, 38, 39, 41

Total	Positive Meaning	Negative Meaning
29	my house resists disasters 13	my house does not resist disasters 16
27	people have enough resources 11	people do not have enough resources 16
13	expansion 13	
9	green areas 9	
9	traffic regulation 9	
8	interior changes 8	

underground 7
 parks 7
 main streets 6
 asphalt 6
 bus lane 6
 painting 5

two stories 5

change to a province 4

hospital 4
 streets 4
 electric buses 4
 junction 4

kitchen 4
 water supply 4
 making pool 4
 green spaces 3
 universities 3
 reconstruction 3
 new child 3
 gas supply 3
 neighbours 2

court 2
 change of houses 2
 saying Azan 2
 city green belt 2
 daily market 2
 flood prevention 2
 educational spaces 2
 mayor 2

big living room 2

identity 2
 control of shops 2
 more factories 2
 plantation 2
 garden 2
 cleanliness 2
 separated stories 2
 rent decrease 2
 bridges 2
 cooperation 2
 dividing female in buses 2
 equality 2
 change of façades 2

Mosque 2
 lighting 2
 insects disappearance 2
 children's marriages 2
 good weather 2
 closed pedestrian 2

council services 2
 factories out 2
 change of entrance 2
 bed room expansion 2
 collecting huts 2
 good neighbours 2
 near bazaar 1
 purity 1
 rebuilding 1
 isolated area 1
 comfortable 1
 new land mark 1
 low rent 1
 using brick 1
 windows 1
 garage 1
 our own mayor 1
 new job 1
 retreated land 1
 cupboards 1

changes of services 7
 infrastructure 7

pollution 5

cellar 5

sewage supply 4

war damages 4

slow process 2

change of narrow allies 2
 animals 2

grass market out 2

building towers 2

earthquake 2

1	roof 1
1	stairs 1
1	playground 1
1	close to nature 1
1	near Mosque 1
1	price control 1

Table A.2.6 Positive and negative responses to the questions which have been classified as 'changes'

• Impacts (Relations, Environment, Upper Systems)

Responses to questions numbers: 17, 18, 29, 40, 54

Total	Positive Meaning	Negative Meaning
23	near work 23	
20		
19	nothing 20	far from work 19
18		dependent growth 18 (by: design 3, buses 2, underground 2, modern Tehran 1, chain of store 1, iron skeleton 1, lack of local material 1, multi- stories 1, cement 1, styles 1, foods and clothes 1, new possibilities 1, industrialization 1.)
14	positive aspects of the past 14	negative aspects of the past 13
13		emigrant 10
10		vehicles 9
9		
8	independent growth 8 (iron complex 2, no change 1, not enough material 1, ordinary buildings 1, local material 1, others experiences 1, increase in production.)	
5	accessibility 5	
4	social activities 4	
4	neighbours 4	new styles in architecture 4
4		pollution 3
3		Western style 3
3	celebrations	air pollution 2
2	quality 2	
2	geographic aspects 2	
2	culture 2	
2	economic 2	
2	kindness 2	
2	old buildings 2	
2	tradition 2	
2	tranquillity 2	air force campus 1
1		working hard 1
1	participation 1	
1	quietness 1	
1	near centre 1	
1	good value 1	
1		fashion 1
1	religion 1	lack of cellar 1
1		waste of time 1
1		rocket attack 1
1		sound pollution 1
1		foreign commodities 1
1		having debt 1
1		oil companies 1
1		no cooperator 1
1		being late 1
1		luxury life 1
1		
1	safety 1	expensiveness 1
1	weather 1	satellite 1
1		
1	being on time 1	
1	no need for car 1	stress 1
1		

1	garden 1	
1		
1		machinist 1
1		programmes 1
1		electrical project 1
1		factories 1
1	Gary bearded 1	
1		materialistic culture 1
1		building materials 1
1		traffic 1
1	with family 1	
1	familiarity 1	
1		new architecture 1

Table A.2.7 Positive and negative responses to the questions which have been classified as 'impacts'

• Present State, Future Plan (Desires, Plan, Changes) and Impacts

Responses to question numbers 4 to 56

Total	Positive Meaning	Negative Meaning
50	Mosques 50	
44	people's participation in production 44	
41	bazaar (covered) 41	
39		infrastructure 39
38	brick 30	brick 8
36	neighbours 29	neighbours 7
35	courtyard 35	
31	hospital 27	hospital 4
30	school / college 30	
28	near work 28	
28	cooperation 28	
28	main street 26	main street 2
26	green areas 26	
26	rich zone 26	
25		I have not chosen my neighbours 25
23	park 19	parks 4
23	council's design 23	
23		nothing 23
21	expansion 21	dependent growth 21
21		
21	saving 21	
20	city centre 15	city centre 5
20	street 20	
19	northern part of Tehran 18	northern part of Tehran 1
19	new town 14	new town 5
19		far from work 19
19	clay 11	clay 8
18	others 18	
18	bank's loan 18	
18	kitchen 18	
18	present area 17	present area 1
17	privacy 9	privacy 8
17	helping 17	
16	government's aids 16	
16	garden 16	
16		people do not have enough resources 16
16	people's help 16	
16	cement 4	cement 12
16		my house does not resist disasters 16
15	old town 12	old town 3
14	allies (covered) 13	narrow allies 1
14	factories 2	factories 12
14	positive aspects of the past 14	
14	old buildings 6	old buildings 8
14	north east of Tehran 14	
13	shortage of space 8	shortage of space 5
13	quietness 13	
13		negative aspects of the past 13

13	my house resist disasters 13	
13	accessibility 13	
13	dairy products 13	
13		southern part 13
12	universities 12	weak against disasters 13
12	adaptation 9	
12		lack of adaption 3
12	mass media 12	cars 12
12	two stories 12	
12	electric post 6	electric post 6
12	high and unique culture 11	low culture 1
11		plaster 12
11	good location 11	economic reasons 11
11	sympathy 11	
11	firmness 11	
11	ritual celebration 11	
11	people have enough resources 11	
11	libraries 11	
11	fresh weather 11	
10	shopping centre 8	shopping centre 2
10	security 9	security 1
10	stone 10	
10	tranquillity 9	tranquillity 1
10	monuments 10	
10	old square 10	
10	marble 8	marble 2
10		emigrant 10
10	grass market 2	grass market 8
10	asphalt 6	asphalt 4
10	traditional style 10	
10	health 10	
10	carpet 10	
10	independent growth 10	
10	traffic regulation 10	
10	despatch 6	despatch 4
10	previous square 4	
9		big towers 10
9	quarter shops 9	being expensive 9
9	well informed 9	
9	stylish 9	
9	apartment 5	apartment 4
9	foods 9	vehicles 9
9		lack of cellar 5
8		pollution 8
8	celebration 8	
8	kindness 8	
8	largeness 8	
8	myself 8	
8	oldness 8	
8	reconstruction 8	
8	convenience 8	
8	aluminium 6	aluminium 2
8	clothes 8	
8	educational spaces 8	
8	old castle 8	
8	rivers 6	river 2
8	iron skeleton 8	
8	quarter 8	
8	interior changes 8	
8	relative's help 8	
8	Moharam ceremony 8	
8	home equipments 8	
8	court 8	
8	building materials 6	building material 2
8		eastern part of Tehran 8
8	beauty 8	
8	near relatives 8	
8		prison 8
8	cemetery 2	cemetery 6
7	future plan 7	
7	local societies 7	
7	underground 7	
7	iron 1	iron 6
7		crowd 7
7	museum 7	
7	regularity 7	changes of services 7

7	countryside 7	
7	housing cooperations 7	more work 7
7	wasted land 5	wasted land 2
7	services 2	services 5
7	heritage 7	old building 7
7	parents 7	
7	having land 7	
7	good region 7	
7	castle (Arg) 7	
7	identity 5	no identity 2
6		busy quarter 6
6	closed alley 3	closed alley 3
6	ownership 6	
6	stadium 6	
6	population control 6	
6	purity outside 6	black ston 6
6	glazed tile 4	glazed tile 2
6	electrical instruments 6	traffic jam 6
6	palace 6	children's noise 6
6	bus lane 6	new styles in architecture 6
6	bread 6	
6	low rent 6	lodges 6
6	small and sufficient 6	
5	cheap 5	
5	radio and T. V. 5	
5	near centre 5	
5	airport area 5	
5	social security 5	
5	families' parties 5	
5	bed room expansion 5	no choice 5
5	painting 5	residential tower 5
5	shelter 5	
5	wooden doors 5	
5	going to work 5	
5	small town 5	
5	cleanliness 5	
5	public affairs 5	
5	electronics 5	
5	water supply 5	
5	dam 5	
5	information 5	
5	more schools 5	
5	insects 3	insects 2
5	books 5	
5	lighting 5	
5	more trees 5	
5	cities gates 5	
5	Islamic style 5	
4	good salary 4	
4	face to face relationship 4	
4	junction 4	kenitext 4
4	making pool 4	war damages 4
4	market 4	
4	meat 4	
4	railway 4	
4	business area 4	sewage supply 4
4		periphery 4
4		interruption 4
4	shrine 4	small windows 4
4		sun-dried brick 4
4	free education 4	neighbour's house 4
4		government's offices 4
4	I have chosen my neighbours 4	
4	fruits 4	oil companies 4
4	Hossainieh 4	
4	garage 4	

- social activities 4
 old garden 4
 one story 4
 electric buses 4
 both parties 4
 wind-catcher 4
 cultural centre 4
 a quarter 4
 change to a province 4
 south port 4
 first aids 3
 separated stories 3
 being insight 3
 saffron 3
 shops 3
 wall in front 3
 wooden windows 3
 rush hour 3
 windows 3
 respect 3
 daily market 3
 less streets 3
 transport 3
 less cars 3
 bridge 3
 public services 3
 handicraft 3
 local associations 3
 pool 3
 audio-visual facilities 3
 changing 3
 bank 3
 people 3
 parent's help 3
 gas supply 3
 making budget 3
 medicine 3
 memorial (past) 3
 mobilization 3
 domes 3
 diversity 2
 more facilities in educational sector 3
 contentment 3
 humidity 2
 near garden 3
 north west of Tehran 2
 new child 3
 new organizations 3
 standing at an angle to the street 3
 friends 2
 friendship 2
 employment 2
 dividing female in buses 2
 Gary bearded 2
 gathering in afternoon 2
 high roof (dome) 2
 flood trevention 2
 intervention 2
 geographic aspects 2
 decoration 2
 fast access 2
 Islamic loan 2
 equality 2
 Jama Pray 2
 giving responsibility 2
 familiarity 2
 cement factory 4
 concrete 4
 unemployment youth 3
 Western style 3
 low light 3
 interference 3
 diversity 1
 humidity 1
 not healthy 3
 dirtiness 3
 north west of Tehran 1
 no relationship 3
 gable roof 2
 deep well 2
 irony windows 2
 Isogam 2
 fashion 2
 execution square 2

- going to Mosque 2
 good infrastructure 2
 extra classes 2
 large guest room 2
 wet foundation 2
 welfare 2
 less expectation 2
 adding one story 2
 less energy consumption 2
 adequate 2
 administration offices 2
 water cistern 2
 agriculture 2
 safety 1
 architects 2
 toilet outside 2
 curing 2
 telephone 2
 Télécabin 2
 Tehran's water 2
 support 1
 supermarket 1
 strong foundation 2
 strong buildings 2
 sports 2
 specialists 2
 people's religion 2
 society 2
 socialization 2
 small industries 2
 may God help us 2
 mayor 2
 small house 2
 basement 2
 similarity 1
 Mobarakeh Isfahan 2
 shopping 2
 separate families 2
 searching 2
 more factories 2
 more choice to repair 2
 saying Azan 2
 saving material 2
 more come and go 2
 belief 2
 more knowledge 2
 Saghakhaneh 2
 old cemetery 2
 mortgages 2
 right rules 2
 motivation 2
 right education 2
 municipality 2
 council's services 2
 big living room 2
 reinforced concrete 2
 radio station 2
 controlling problems 2
 control of shops 2
 earthquake 2
 lack of shops 2
 air pollution- 2
 lack of safety 1
 lime 2
 limited facilities 2
 animals 2
 timber 2
 tar 2
 Azadi monument 2
 stairs 2
 south east 2
 masonry 2
 slow process 2
 similarity 1
 being homeless 2
 sand 2
 court of justice 2
 wood 2
 restaurant 2
 multi-jobs 2
 railway stations 2
 building towers 2
 queues for shopping 2

quality 2	queues for bus 2
ceramic 2	bus stations 2
public bath 2	
practical knowledge 2	change of façades 2
necessary equipment 2	
change of narrow allies 2	
constant 2	
change of houses 2	
change of entrance 2	
network of streets 2	police station 2
plentiful 2	
playground 2	
plantation 2	
charities 2	
new technology 2	
new materials 2	
people's close relation 2	
communication 2	
cheap zones 2	
people's unity 2	
children's marriages 2	
patience 2	
comfortable 2	
parking 2	
no bath inside 2	
cinemas 2	noisy 2
city green belt 2	
coloured glass 2	
P.T.A. relationships 2	not updated 2
other cities 2	not high enough ceiling 2
open spaces 2	
on the south 2	
old generation 2	
old house 2	
closed pedestrian 2	old bath 2
cold stores 2	
old buildings 2	
pelitic 1	
old ice-house 1	
historical 1	
cloth 1	
disorderly 1	
collective work 1	high walls 1
	housing imitation 1
close to nature 1	not repairable 1
	high density 1
	dishonour 1
colour 1	
cleaning materials 1	
our own mayor 1	
out of sight 1	
civility 1	
Imam Committee 1	
Norouz new year 1	down town 1
duty 1	no change 1
chocolate 1	immodest modernism 1
	no cooperators 1
earthenware 1	
no need for car 1	
cheerfulness 1	
people's feeling 1	no hope 1
people's representative 1	no institution 1
wooden beams 1	comparison 1
new land mark 1	having debt 1

- personal arrangement 1
 places for sports 1
 having home 1
 new job 1
 computer facilities 1
 indirect education 1
 harmonized features 1

 power 1
 neatly things 1
 construction 1
 change of walls 1
 harmlessness 1
 price control 1

 ceremonies 1
 productivity 1

 protecting nature 1
 near school 1

 habitat 1
 by women 1
 consulting 1
 butchery 1
 inns 1
 near bazaar 1
 natural relation 1
 natural facilities 1
 my quarter 1
 grocery 1
 cool inside 1
 greeting 1
 reading Quran 1

 recreation places 1
 easy to build 1
 birthday celebration 1
 cooperative shops 1
 reinforcing 1

 economic centre 1
 my help 1
 good vision to outside 1
 moving 1
 retreated land 1
 revival of character 1
 belonging 1
 motorcycle 1
 right classes 1
 council's market 1
 educated people 1
 Moslems 1

 good teacher 1

 good values 1
 instalments 1

 more space 1
 saving time 1
 saving money 1
 more control 1
 good methods 1
 more closer 1
 being active 1
 self sufficient 1
 self education 1
 sensitivity 1
 covered path 1

 going to school 1
 sharing 1

 place for animals 1
 in the queue 1
 discord 1

 changeability 1

 neglecting past 1
 need of permission 1
 need more time to clean 1

 industrialization 1

 bad programmes 1

 different zones 1

 borrowing 1

 big family 1

 rocket attack 1
 roofs 1
 worker's place 1

 satellite 1

 separate toilet 1
 being late 1

being on time 1	
creation 1	
density 1	
shopping after work 1	
being brave 1	Ekbatan towers 1
God's help 1	
militaries 1	
Interior design 1	
God knows 1	small stairs 1
being flat 1	
investments 1	
decentralization 1	
maximum use of land 1	
small wall 1	
social courses 1	
social discipline 1	electrical project 1
barberry 1	
crystal 1	materialistic culture 1
marriage 1	sound pollution 1
isolated area 1	
cultural associations 1	
it is good 1	
Karaj town 1	bad taste 1
cupboards 1	bad shape 1
emigrant control 1	stop growing 1
	stranger in group 1
magnificent inside 1	stress 1
magazine 1	
attractive for tourists 1	
	foreign commodities 1
	machinist 1
	luxury life 1
dates 1	low density 1
teaching people 1	teenagers 1
Tehran University 1	darkness 1
knowledge 1	lack of experts 1
	they should go 1
	thick foundation 1
	thick walls 1
	thin walls 1
local cooperation 1	
local material 1	too much land 1
tour-study 1	
local charity 1	
township 1	
local society 1	
local clothes 1	
an opportunity 1	
foreign language 1	energy consumption 1
travelling 1	
lift 1	
all facilities in one story 1	
air filtering 1	
fish 1	
entrance 1	
unity 1	
life experience 1	
urban discipline 1	
using brick 1	
utilizing 1	vast spaces 1
vegetable 1	air force campus 1
	villagers 1
visual pleasure 1	
few stories 1	

1		fanatic people 1
1		waste of time 1
1	custom office in Khoramshahr 1	
1	less faults 1	
1		lack of new technology 1
1	less noise 1	
1		lack of cooperation 1
1	weekend picnic 1	
1	large living room 1	
1		expensiveness 1
1		west 1
1	extra space 1	
1		large space 1
1		extensive 1
1	workshop 1	
1		working hard 1
1	wisdom 1	
1	with family 1	
1	women's veils 1	

Table A.2.8 Positive and negative responses to question numbers from 4 to 56

e) The Reasons for the Responses to the Questions

• Present State (Satisfaction, Problems, ...)

Reasons for responses to question numbers: 9, 10, 23, 24, 30, 31, 32, 37, 42, 43, 46, 49, 50, 51, 52, 53

29 oldness	4 charities	3 learning
22 greenery (parks)	4 bad smell	3 lack of freedom
20 noise	4 weak economy	3 holly place
18 historical issues	4 local materials	3 kindness
17 tranquillity	4 utility	3 hopeful people
16 accessibility	4 helping poor	3 irregularities
16 pollution	4 lack of reality	3 garbage
16 helping each other	4 heritage	3 humidity
16 cheaper	4 strong background	2 dependent
15 security	4 convenience	2 darkness
15 recreation	4 nature	2 good plan
14 religious duty	4 social equity	2 good style
14 beauty	4 familiarity	2 dust
13 good weather	4 crowd	2 employment
12 health care	4 new items	2 fast action
10 all items	4 Islamic (principles, traditions, orders)	2 consuming
10 good weather	4 independency	2 city's function
9 economic reasons	4 adaptation	2 conflict
9 comfortable	4 not comfortable	2 city centre
8 ugly	4 information	2 firmness
8 cooperation	4 easy to buy	2 water
8 youth training	4 not healthy	2 good culture
8 high culture	4 problem solving	2 good water
7 monument	4 insects	2 greatness
7 nearer	3 disturbance	2 art
6 traffic	3 preventing sin	2 sustainable
6 traditional identity	3 privacy	2 support
6 active families	3 duty to communicate	2 guests
6 shopping	3 regularity	2 bad behaviour
6 good service	3 development	2 hard to expand
6 low culture	3 rich people	2 safety
6 public affair	3 not good for child	2 rush hour
5 quietness	3 inconvenience	2 children
5 insecure	3 sadness	2 respect nature
5 respect past	3 schools	2 bad vision
5 busy	3 no interference	2 relatives
5 useless	3 export	2 high rent
5 saving time	3 self reliance	2 relationship
5 no privacy	3 social centre	2 bad weather
5 shortage of space	3 staffs area	2 protecting
5 strangers	3 luxurious and large	2 problems
5 communication	3 transformation	2 praying
5 closeness	3 centre	2 power
5 gathering peoples together	3 losing time	2 participation
5 memorial	3 happy communication	2 hot weather
4 changeability	3 children	2 orderly
4 cleanliness		2 open spaces

2 old fashion	1 no car	1 corruption
2 identity	1 expensive	1 spirituality
2 not adequate	1 elite people	1 sport
2 illness	1 inappropriate	1 stable architecture
2 Imam memorial	1 close relationship	1 closed
2 important	1 easy to use	1 storage
2 no sight	1 ill city	1 awareness
2 new town	1 easy to clean	1 control
2 near work	1 not private	1 greeting
2 information for youth	1 not citizen	1 advise
2 near centre	1 not relax	1 symbol of defiance
2 Mosque	1 not sustainable	1 symbol of city
2 more sunlight	1 not green	1 technology
2 centrality	1 earning money	1 tolerable
2 less windows	1 old technology	1 authority
2 interference	1 I like it	1 green belt
2 learn to resist	1 old age	1 antiques
1 fundamental	1 capital	1 according to needs
1 it is economic	1 I do not like	1 consensus
1 fulfilling empty gaps	1 good transport	1 transport in past
1 labour town	1 organic	1 trust
1 fruit producer	1 our culture	1 ancient culture
1 lack of programme for youth	1 good health	1 unemployment
1 lack of new technology	1 pilgrimage	1 unity
1 fresh weather	1 place of birth	1 urbanism
1 largeness	1 plentiful	1 useful
1 laziness	1 multi-function	1 amusement
1 futurity	1 political issues	1 coming and going
1 free of charge	1 political news	1 waste
1 less cost	1 politic-religious	1 water cistern
1 less cars	1 buying with car	1 commercial
1 intelligence	1 homework	1 all works here
1 lesson of past	1 good future	1 wealthy
1 like village	1 diversity	1 without relation
1 literally	1 price control	1 without accident
1 forgiveness	1 dishonest gathering	1 worship
1 look for change	1 dirtiness	1 worth seeing
1 feelings	1 addicted	1 wrong symbol
1 low density	1 progressive	1 youth future
1 feeling death	1 cheerfulness	
1 far distance	1 blossom of youth	
1 many shops	1 punctuation	
1 marketing	1 purposeful life	
1 mechanism	1 better agriculture	
1 meeting	1 real life	
1 centre of import	1 reasonable price	
1 intact area	1 high technology	
1 ceremonies	1 digestible	
1 more relax	1 high expenses	
1 more healthy	1 hierarchy	
1 more option	1 good quality	
1 more children	1 good economy	
1 more support	1 bad management	
1 more narrow street	1 Islamic Revolution	
1 civilization	1 reward	
1 motivation	1 depend on money	
1 family number	1 good sight	
1 genuineness	1 deficiency	
1 God's letter	1 hard transport	
1 celebrations	1 saving money	
1 necessity	1 bad style	
1 new fashion	1 scattered function in new architecture	
1 increasing knowledge	1 daily shopping	
1 familiar seller	1 science	
1 no cheat	1 second story	
1 car park	1 bad relation	
1 no cooperation	1 cultural prestige	
1 no way	1 sentiment	
1 no help	1 service manner	
1 no factory	1 shadow	
1 no design	1 sharing happiness	
1 in process	1 city fabric	
1 no accessibility	1 short street	
1 no marriage	1 bad infrastructure	
1 no relation	1 sincerity	
1 no supply	1 creation	

Table A.2.9 Compilation of the reasons for 'present state'

• Desire (Intention, Expectation, Preference, ...)

Reasons for responses to question numbers: 6, 13, 15, 16, 21, 25, 26, 27, 33, 34, 35, 36, 44, 45

22 good weather	2 insects	1 spirituality
19 convenience (+18, -1)	2 intervention	1 authority
18 beauty	2 place for ritual	1 exiting
15 helping	2 celebration	1 sympathy
14 culture (+5, -9)	2 commercial	1 heavy
13 experts	2 open space	1 easy to reconstruct
12 cooperation	2 coldness	1 controlling problem
12 solidity	2 new built	1 transport
11 weak	2 near cemetery	1 good for elderly
11 privacy	2 near relatives	1 good smell
10 independency	2 natural relation	1 unique façade
10 good services	2 city centre	1 duty
9 well informed	2 luxurious	1 durability
9 my design	2 memorial	1 good water
8 pollution (+7, -1)	1 management	1 artefact
8 adaptation (+2, -6)	1 modern	1 disorderly
7 near work	1 more relation	1 accuracy
7 garden	1 closed alley	1 West culture
7 party	1 low light	1 working
7 crowd	1 limited rules	
7 lack of knowledge	1 cheap	
7 hard to use	1 less facilities	
6 low density	1 near Tehran	
6 ugly	1 less sound	
6 playground	1 no identity	
6 sunshine	1 no time	
5 sad	1 no choice	
4 complexity	1 non-residential	
4 cleanliness	1 not stable	
4 facilities	1 not healthy	
4 real needs	1 occupying space	
4 security	1 old town	
4 tranquillity	1 old style	
3 coarse	1 oldness	
3 children	1 lack of ability	
3 accessibility	1 parking	
3 green area	1 it is good	
3 warm	1 perfection	
3 utility	1 irreparable	
3 traditional	1 boring	
3 economic reasons	1 plentiful	
3 swimming	1 big house	
3 experience	1 favourite	
3 poverty	1 communication	
3 regularity	1 better	
3 social activities	1 producing	
3 small enough	1 progress design	
3 services	1 in process	
2 different ideas	1 multi-function	
2 fashion	1 in prison	
2 fast access	1 heterogenous	
2 dirty	1 far from Tehran	
2 first house	1 relatives	
2 decay	1 heritage	
2 weak accessibility	1 residential	
2 not sustainable	1 retired	
2 good sight	1 rituals	
2 washable	1 being together	
2 good location	1 safety	
2 corruption	1 consulting	
2 unique culture	1 far from the city	
2 artificial	1 sewage	
2 arts	1 sharing	
2 techniques	1 shopping	
2 bad weather	1 far from work	
2 religious	1 small houses	
2 belonging	1 familiarity	
2 quietness	1 bad location	
2 protection	1 special group	
2 previous place	1 specialized	

Table A.2.10 Compilation of reasons for 'desire'

• Future Plan (Plan)

Reasons for responses to question numbers: 7, 11, 14, 19, 22, 28, 47, 48, 55, 56, 57

14 people's money	1 characteristic
14 economic reasons	1 near school
11 good location	1 by friends
9 no choice	1 equal distribution
7 regularity	1 new laws
7 expansion	1 fate
6 small enough	1 health
6 near relatives	1 cheerful
5 cooperation	1 no criteria
5 having court	1 non-governmental
5 cheap	1 old style
5 individual design	1 open quarter
5 labour power	1 by agencies
4 large	1 own authority
4 changeability	1 bright
4 near city centre	1 having choice
4 own desire	1 people's suggestions
4 no pollution	1 plan for the future
4 good weather	1 precise design
4 participation	1 governments' land
4 private buildings	1 educated people
4 two stories	1 recognition
4 convenient	1 government loan
4 difficult to choose	1 right direction
3 control	1 conservation
3 accessibility	1 saving money
3 tranquillity	1 good thinking
3 good neighbours	1 good material
3 sympathy	1 shared benefits
3 I was the last	1 architects are people
3 lack of knowledge	1 solid material
3 quietness	1 solving shared problems
3 near work	1 solving shortage of things
2 environmental circumstances	1 control benefits
2 cost of building	1 good salary
2 familiarity	1 sustainability
2 culture	1 development
2 first house	1 alone it is impossible
2 God knows	1 their information
2 they are different	1 density
2 stylish	1 defence
2 strongness	1 all are neighbours
2 self protection	1 uncontrollable
2 saving materials	1 unity
2 same needs	1 vitality
2 being homeless	
2 best use of facilities	
2 people's closeness	
2 by chance	
2 no hope to the future	
2 help	
2 by themselves	
2 independency	
2 by drawing	
2 infrastructure	
2 it is beneficial	
2 more facilities	
2 location	
1 change into better	
1 controlling growth	
1 by instalments	
1 less cars	
1 its land	
1 low rent	
1 more sincerity	
1 its nature	
1 more population	
1 most are tenants	
1 my support	
1 no institution	

Table A.2.11 Compilation of reasons for 'future plan: plan'

• Future Plan (Changes)

Reasons for responses to question numbers: 8, 12, 20, 38, 39, 41

13 expansion	1 new council's rules
12 health	1 no asylum
7 old infrastructure	1 no well
6 good materials	1 being behind in technology
6 local materials	1 no heavy vehicle
5 weak materials	1 no progress
5 good weather	1 no organization
5 cleanliness	1 insecure
5 less traffic	1 being active
5 easy traffic	1 good sight
4 not sufficient money	1 old style
4 labour power	1 anarchy
4 independency	1 amusement
4 no design principle	1 good water
4 convenience	1 past is not enough
4 economic support	1 identity
4 oldness	1 place for children
4 expensiveness	1 playground
3 children's future	1 good shelter
3 designer	1 council confirmation
3 beauty	1 price of house
3 without my control	1 privacy
3 I have built it	1 protection
3 old material	1 reconstruction
3 weak function	1 house price
3 weak system	1 refreshment
3 variety	1 reinforced concrete
3 strong foundation	1 relief
3 one story	1 saving time
3 population increase	1 comfortable
3 fast access	1 short longevity
3 fresh weather	1 growth
3 gathering people together	1 social relation
2 fashion	1 government's control
2 factories	1 easy for cars
2 engineer made	1 government built
2 employment	1 time in city
2 council authority	1 tradition
2 sustainability	1 tranquillity
2 strong construction	1 usefulness
2 shortage	1 education
2 security	1 enough experience
2 recreation	1 enjoyment
2 price control	1 weak ground
2 place for guests	1 accessibility
2 change of style	1 academic area
2 cheap material	
2 less pollution	
2 close to nature	
2 less heavy vehicles	
2 input is not cultural	
2 less smoke	
1 climatic reasons	
1 lack of money	
1 large plan	
1 justice	
1 individuality	
1 less disease	
1 less smell	
1 inadequate design	
1 inadequate products	
1 light	
1 living	
1 inadequate space	
1 marketing	
1 more trust	
1 more accessibility	
1 more welfare	
1 more space	
1 new built	

Table A.1.12 Compilation of reasons for 'future plan: changes'

• Impacts (Relations, Environment, Upper Systems)

Reasons for responses to question numbers: 17, 18, 29, 40, 54

8 short distance
 6 residential place
 5 being in centre
 5 my choice
 5 pollution
 4 work dependent
 4 no choice
 3 different zone
 3 population
 2 unreal facilities
 2 too many cars
 2 no identity
 2 having no car
 1 free work
 1 good access
 1 having car
 1 factories
 1 imitation
 1 lack of knowledge
 1 many changes
 1 misuse of vehicles
 1 multi-tribes
 1 competition
 1 no electric light
 1 no adaptation
 1 no access
 1 no job
 1 economic factors
 1 no harmony
 1 no tradition
 1 expensiveness
 1 citizenship
 1 earning money
 1 cities' expansions
 1 rich architecture
 1 scattered land use
 1 big city
 1 stranger
 1 exogenous culture
 1 traffic
 1 dependency
 1 we did not have it
 1 cities' welfare

Table A.2.13 Compilation of reasons for 'impact'

• Present state, Future Plan (Desire, Plan, Change) and Impact

Reasons for responses to question numbers from 4 to 56

54 good weather	17 recreation	10 all items
37 helping (each other, poors)	16 good services	10 local materials
36 culture (+18, -18)	16 religious duty	10 quietness
35 beauty	15 privacy	9 well informed
35 pollution	14 no choice	9 labour power
34 oldness	14 ugly	9 small enough
31 convenience (+30, -1)	14 their money	9 my design
27 economic reasons	13 good location	8 gathering people together
25 cooperation	13 experts	8 short distance
25 health care	13 regularity	8 youth training
25 greenery (parks)	13 cleanliness	8 changeability
25 tranquillity	12 adaptation (+6, -6)	8 people's closeness
23 accessibility	12 solidity	7 playground
22 cheaper ones	11 lack of knowledge	7 shopping
21 security	11 children's future	7 party
20 expansion	11 weak	7 traffic
20 noise	11 crowd	7 residential place
20 independency	10 traditional identity	7 shortage of space
18 historical issues	10 comfortable	7 good materials

7 nearer	3 different zone	2 bad vision
7 hard to use	3 dirtiness	2 self protection
7 old infrastructure	3 coarse	2 different ideas
7 garden	3 disturbance	2 saving materials
7 near work	3 centre	2 having no car
7 low density	3 celebration	2 saving money
7 memorial	3 without my control	2 same needs
7 monument	3 weak function	2 being homeless
7 familiarity	3 weak system	2 rush hour
6 participation	3 happy communication	2 respect nature
6 active families	3 warm	2 belonging
6 communication	3 holly place	2 high rent
6 saving time	3 experience	2 relationship
6 strangers	3 variety	2 best use of facilities
6 sunshine	3 export	2 multi-function
6 near relatives	3 utility	2 problems
6 insects	3 factories	2 by themselves
6 insecure	3 swimming	2 previous place
6 public affair	3 hopeful people	2 hot weather
6 near city centre	3 strong foundation	2 praying
5 no privacy	3 staffs area	2 power
5 near work	3 social centre	2 by drawing
5 weak materials	3 social activities	2 political news
5 transformation	3 services	2 place for guests
5 expensiveness	3 self reliance	2 place for ritual
5 having court	3 humidity	2 by chance
5 busy	3 I was the last	2 centrality
5 fast access	3 schools	2 illness
5 easy traffic	3 safety	2 Imam memorial
5 my choice	3 sadness	2 orderly
5 sad	3 rich people	2 important
5 respect past	3 good water	2 in process
5 heritage	3 relatives	2 old fashion
5 sustainable	3 price control	2 old style
5 individual design	3 preventing sin	2 change into better
5 less traffic	3 poverty	2 change of style
5 largeness	3 one story	2 not adequate
5 being in centre	3 old material	2 decay
5 protection	3 not good for child	2 darkness
4 lack of reality	3 inconvenience convenience	2 cheap material
4 bad smell	3 no identity	2 information for youth
4 two stories	3 garbage	2 not sustainable
4 real needs	3 no interference	2 infrastructure
4 social equity	3 new built house	2 input is not cultural
4 Islamic (principles, traditions, orders)	3 luxurious and large	2 cheerfulness
4 work dependent	3 I have built it	2 council authority
4 new items	3 losing time	2 no hope to the future
4 control	3 learning	2 no sight
4 strong background	3 lack of freedom	2 interference
4 information	3 kindness	2 intervention
4 problem solving	3 irregularities	2 new town
4 city centre	3 identity	2 city's function
4 not healthy	3 good neighbours	2 near cemetery
4 charities	2 God knows	2 near relatives
4 not sufficient money	2 firmness	2 close to nature
4 complexity	2 earning money	2 it is beneficial
4 bad weather	2 dust	2 coldness
4 not comfortable	2 fast action	2 natural relation
4 development	2 educated people	2 Mosque
4 no pollution	2 engineer made	2 more sunlight
4 private buildings	2 environmental circumstances	2 more facilities
4 difficult to choose	2 weak accessibility	2 conflict
4 nature	2 washable	2 cost of building
4 no design principle	2 unreal facilities	2 marketing
4 own desire	2 good plan	2 luxurious
4 open spaces	2 good style	2 location
4 art	2 unique culture	2 less windows
4 sympathy	2 amusement	2 less pollution
4 facilities	2 too many cars	2 less smoke
4 good sight	2 they are different	2 consuming
4 duty to communicate	2 techniques	2 less heavy vehicles
4 employment	2 support	2 less cars
4 easy to buy	2 greatness	2 learn to resist
4 fashion	2 artificial	1 laziness
4 economic support	2 stylish	1 good health
4 first house	2 strongness	1 less cost
4 fresh weather	2 strong construction	1 control benefits
3 dependency	2 guests	1 large plan
3 corruption	2 authority	1 lack of ability
3 designer	2 bad behaviour	1 good future
3 commercial	2 hard to expand	1 less disease

1 less facilities	1 no cooperation	1 free of charge
1 less sound	1 city fabric	1 good water
1 lack of new technology	1 no cheat	1 forgiveness
1 less smell	1 easy for cars	1 price of house
1 lack of programme for youth	1 citizenship	1 by instalments
1 lesson of past	1 no adaptation	1 homework
1 light	1 futurity	1 bright
1 like village	1 no criteria	1 good smell
1 limited rules	1 cities' expansions	1 producing
1 literally	1 no tradition	1 progress design
1 living	1 no harmony	1 progressive
1 consulting	1 no job	1 boring
1 controlling growth	1 no time	1 blossom of youth
1 look for change	1 no access	1 defence
1 God's letter	1 no asylum	1 punctuation
1 conservation	1 no well	1 purposeful life
1 low rent	1 cities' welfare	1 big city
1 low light	1 no heavy vehicle	1 big house
1 controlling problem	1 no institution	1 real life
1 genuineness	1 no progress	1 reasonable price
1 management	1 no organization	1 recognition
1 many shops	1 intact area	1 reconstruction
1 many changes	1 creation	1 better agriculture
1 lack of money	1 fundamental	1 refreshment
1 mechanism	1 inappropriate	1 high technology
1 meeting	1 inconvenience residential	1 reinforced concrete
1 consensus	1 inconvenience-government	1 high expenses
1 misuse of vehicles	1 daily shopping	1 easy to reconstruct
1 modern	1 not healthy	1 relief
1 labour town	1 not stable	1 hierarchy
1 more option	1 individuality	1 being together
1 more sincerity	1 not sustainable	1 heterogenous
1 more relation	1 not relax	1 being active
1 more space	1 not green	1 retired
1 more welfare	1 characteristic	1 reward
1 more accessibility	1 fulfilling empty gaps	1 feelings
1 more trust	1 increasing knowledge	1 rich architecture
1 more narrow streets	1 inadequate products	1 right direction
1 good access	1 not private	1 rituals
1 more population	1 not citizen	1 deficiency
1 more support	1 occupying space	1 density
1 more children	1 inadequate space	1 feeling death
1 justice	1 old style	1 favourite
1 more relax	1 old age	1 heavy
1 more healthy	1 old town	1 depend on money
1 its nature	1 inadequate design	1 having choice
1 most are tenants	1 in prison	1 being behind in technology
1 motivation	1 fruit producer	1 scattered land use
1 multi-tribes	1 old technology	1 scattered function
1 competition	1 ceremonies	1 fate
1 my support	1 easy to use	1 science
1 coming and going	1 centre of import	1 second story
1 its land	1 open quarter	1 bad relation
1 it is good	1 imitation	1 education
1 closed alley	1 organic	1 having car
1 close relationship	1 our culture	1 sentiment
1 it is economic	1 ill city	1 service manner
1 near school	1 own authority	1 far from work
1 climatic reasons	1 parking	1 sewage
1 near Tehran	1 car park	1 shadow
1 council confirmation	1 capital	1 shared benefits
1 Islamic Revolution	1 past is not enough	1 sharing happiness
1 civilization	1 good salary	1 sharing
1 necessity	1 people's suggestions	1 shopping with car
1 irreparable	1 perfection	1 bad style
1 new council's rules	1 pilgrimage	1 short longevity
1 easy to clean	1 I do not like	1 bad management
1 new laws	1 good transport	1 short street
1 good thinking	1 place for children	1 hard transport
1 new fashion	1 place of birth	1 sincerity
1 no electric light	1 plan for the future	1 bad infrastructure
1 no car	1 by agencies	1 small houses
1 no supply	1 by friends	1 social relation
1 no relation	1 I like it	1 digestible
1 no marriage	1 political issues	1 far distance
1 no accessibility	1 politico-religious	1 far from the city
1 intelligence	1 good economy	1 solid material
1 no design	1 free work	1 bad location
1 no factory	1 good shelter	1 solving shared problems
1 no help	1 house price	1 solving shortage of things
1 no way	1 precise design	1 special group

1 specialized	1 technology	1 usefulness
1 spirituality	1 antiques	1 enjoyment
1 spirituality	1 their information	1 enough experience
1 sport	1 government loan	1 vitality
1 stable architecture	1 time in city	1 expensive
1 far from Tehran	1 tolerable	1 diversity
1 storage	1 government built	1 we did not have it
1 awareness	1 ancient culture	1 equal distribution
1 durability	1 anarchy	1 addicted
1 growth	1 good quality	1 weak ground
1 family number	1 alone, it is impossible	1 accuracy
1 greeting	1 all are neighbours	1 exogenous culture
1 dishonest gathering	1 trust	1 exciting
1 green belt	1 all work here	1 according to the needs
1 governments' land	1 advise	1 West culture
1 artefact	1 uncontrollable	1 academic area
1 familiar seller	1 unique façade	1 working
1 symbol of city	1 disorderly	1 plentiful
1 symbol of defiance	1 unity	
1 architects are people	1 government's control	
	1 good for elderly	

Table A.2.14 Compilation of reasons for the whole concepts

f) Theoretical Reflections on The Reasons

• Present state, Future Plan (Desire, Plan, Change) and Impact

Reasons for responses to questions from 4 to 56

	Ultimate causes	Subjective causes	Objective causes	Formal causes
61			climate (+54, -4)	
37	helping other people 37			
36	culture (+18, -18)			
35	beauty 35		pollution (-35)	oldness (-34)
35				
34				
31	convenience (+30, -1)		economic reasons (-27)	
27				
25	cooperation 25			
25	health care 25		greenery (parks) 25	
25				
25	tranquillity 25		cheaper ones 22	
23	accessibility 23		security 21	expansion (-20)
22				
21			noise (-20)	
20				
20	independency 20			historical issues 18
18				
17	recreation 17		good services 16	
16				
16	religious duty 16			
15	privacy 15			
14		no choice (-14)	their money 14	ugly product (-14)
14				good location 13
14				
13		experts 13	regularity 13	
13				
13	cleanliness 13			adaptation (+6, -6)
12				solidity 12
12				
11		lack of knowledge (-11)		
11	children's future 11			weak buildings (-11)
11			crowd (-11)	
11				
10	traditional identity 10			comfortable 10
10				all items 10
10			local materials 10	
10			quietness 10	

well informed 9

small enough 9
my design 9
gathering people together 8
short distance 8
youth training 8

labour power 9

changeability 8
people's closeness 8

shopping 7

playground (-7)
parties (-7)
traffic (-7)
residential place 7
shortage of space (-7)

nearer 7

good materials 7

hard to use (-7)
old infrastructure (-7)
gardens 7

near work 7

low density 7

memorial 7

monuments 7

familiarity 7

city centres 7

participation 6

active families 6
communication 6

saving time 6

strangers (-6)
sunshine 6

near relatives 6

insects (-6)
insecure (-6)
public affair 6

no privacy (-5)

near city centre 6

near work 5

weak materials (-5)

transformation 5

expensiveness 5

having court 5

busy quarter 5

fast access 5

easy traffic 5

my choice 5
sadness (-5)
respect past 5

heritage 5

sustainable 5
individual design 5
less traffic 5
largeness 5

being in centre 5
protection 5

lack of reality (-4)

bad smell (-4)
two stories 4

real needs 4
social equity 4
Islamic (principles, traditions, orders) 4
work dependent 4

new items 4

control 4

strong background 4
information 4

problem solving 4

charities 4
not sufficient money (-4)
not comfortable (-4)

not healthy (-4)

complexity (-4)
development 4
no pollution 4
private buildings 4

nature 4

difficult to choose (-4)

own desire 4

no design principle (-4)

open spaces 4

		sympathy 4	arts 4
		facilities 4	
duty to communicate 4			good sight 4
		employment 4	
		easy to buy 4	
		economic support 4	fashion (-4)
		fresh weather 4	first house 4
	dependency (-3)		corruption (-3)
designer 3			commercial zone 3
			different zone 3
		dirtiness (-3)	
		coarse (-3)	
celebrations 3		disturbance (-3)	
	without my control (-3)		
happy communication 3			weak function (-3)
			weak system (-3)
		warm 3	
		holy place 3	
variety 3	experience 3		
	utility 3	export 3	
swimming 3		factories 3	
		hopeful people 3	
		staff's area 3	strong foundation 3
		social activities 3	social centres 3
		services 3	
self reliance 3		humidity 3	
		I was the last (-3)	
		schools 3	
safety 3			
sadness 3		rich people 3	
		good water 3	
		relatives 3	
preventing sin 3	price control 3		
		poverty (-3)	
		old material (-3)	one story 3
non convenience (-3)	not good for children (-3)		
no identity (-3)		garbage (-3)	
	no interference 3		
luxurious and large 3			new built house 3
	I have built it 3	losing time (-3)	
	learning 3	lack of freedom (-3)	
kindness 3		irregularities (-3)	
identity 3		good neighbours 3	
	God knows 2		
	firmness 2	dust (-2)	
	earning money 2	educated people 2	engineer made 2
	fast action 2	environmental circumstances 2	
		weak accessibility (-2)	
		washable 2	
		unreal facilities (-2)	
	good plan 2		
	good style 2		
unique culture 2			

amusement 2			
	techniques 2	they are different 2	too many cars (-2)
		support 2	
		greatness 2	artificial (-2)
strongness 2	stylish 2		
authority 2		guests 2	strong construction
			bad behaviour (-2)
			hard to expand (-2)
self protection 2			bad vision (-2)
	saving materials 2	different ideas 2	
	saving money 2	having no car (-2)	
		same needs 2	
		rush hour (-2)	being homeless (-2)
respect nature 2			
belonging 2		high rent (-2)	
		relationship 2	
	best use of facilities 2		
		problems (-2)	multifunction 2
previous place 2	by themselves (-2)		
praying 2		hot weather (-2)	
	power 2		
	by drawing 2	political news 1	
	place for guests 2		
	place for ritual 2		
	by chance 2		
	centrality 2	illness (-2)	
Imam memorial 2			
orderly 2		in process 2	old fashion (-2)
			old style (-2)
	important issues 2		
	change into better 2		
	change of style 2		
	not adequate 2		
		darkness (-2)	decay (-2)
		cheap material (-2)	
information for youth 2			not sustainable (-2)
		infrastructure 2	
	input is not cultural (-2)		
cheerfulness 2	council authority 2		
no hope to the future (-2)		interference (-2)	no sight (-2)
		intervention 2	
			new town
			city's function 2
	near cemetery 2		
	near relatives 2		
	close to nature 2		it is beneficial 2
		coldness 2	
	natural relation 2		Mosque 2
	more sunlight 2		
	more facilities 2	conflict (-2)	
		cost of building 2	
plentiful 2		marketing (-2)	luxurious(- 2)
		location 2	

	less windows 2		
	less pollution 2		
	less smoke 2		
	less heavy vehicles 2	consuming (-2)	
	less cars 2		
learn to resist 2		house price 2	
spirituality 2			parking (-2)
good health 1		laziness (-1)	
	less cost 1		
	control benefits 1		large plan 1
good future 1		lack of ability (-1)	
		less disease (-1)	
		less facilities (-1)	
	less sound 1	lack of new technology (-1)	
	less smell 1	lack of programme for youth (-1)	
	lesson of past 1	light 1	
	like village 1	literally 1	
	limited rules (-1)	living 1	
	consulting 1		
look for change 1	controlling growth 1	God's letter 1	
	conservation 1	low rent 1	
		low light 1	
	controlling problems 1		
	genuineness 1	many shops 1	
	management 1	many changes (-1)	
		lack of money (-1)	
	mechanism 1		
consensus 1	meeting 1		
	misuse of vehicles (-1)		modern buildings 1
			labour town (-1)
more sincerity 1	more option 1		
	more relation 1		
	more space 1		
	more welfare 1		
	more accessibility 1		
more trust 1	more narrow streets 1	more population (-1)	
	good access 1		
more support 1			
more children 1			
justice 1			
more relax 1			
more healthy 1			
	its nature 1	most are tenants (-1)	
motivation 1		multi-tribes 1	
	my support 1	competition (-1)	
	coming and going 1		its land 1
			it is good 1
			closed alley 1
	close relationship 1	it is economic (-1)	
	near school 1	climatic reasons 1	near Tehran 1
		council confirmation 1	
		Islamic Revolution 1	
		civilization 1	

necessity 1			
	new council's rules 1		irreparable (-1)
good thinking 1	new laws 1		easy to clean 1
		no electric light (-1)	new fashion (-1)
		no car (-1)	
		no supply (-1)	no relation (-1)
		no marriage (-1)	no accessibility (-1)
	intelligence 1		no design (-1)
	no factory 1		
	no way (-1)	no help (-1)	
		no cooperation (-1)	city fabric 1
		no cheat 1	easy for cars (-1)
		citizenship 1	no adaptation (-1)
	futurity 1		no criteria (-1)
			cities' expansions (-1)
			no tradition (-1)
			no harmony (-1)
		no job (-1)	
		no time (-1)	no access (-1)
		no asylum (-1)	
		no well (-1)	cities' welfare 1
	no heavy vehicle 1	no institution (-1)	no progress (-1)
		no organization (-1)	intact area (-1)
fundamental aspects 1	creation 1		non appropriate (-1)
			non residential (-1)
non-government 1	daily shopping 1		not healthy (-1)
			not stable (-1)
	individuality 1		not sustainable (-1)
			not relax (-1)
			not green (-1)
	characteristic 1		
	fulfilling empty gaps 1		inadequate products
	increasing knowledge 1		not private (-1)
			not citizen (-1)
			occupying space (-1)
			inadequate space (-1)
			old style (-1)
			old (-1)
			old town 1
	inadequate design 1		in prison (-1)
	fruit producer 1	old technology (-1)	
		ceremonies 1	easy to use 1
			centre of import 1
			open quarter 1
our culture 1	imitations 1		ill city (-1)
	organic 1		
	own authority 1	capital 1	
		past is not enough 1	
good salary 1	people's suggestions 1		
perfection 1			
pilgrimage 1			

	place for children 1		I do not like (-1) good transport 1
	plan for the future 1 by agencies 1 by friends 1	place of birth 1	
free work 1		political issues 1 politico-religious 1 good economy 1	I like it 1
			good shelter 1 precise design 1
forgiveness 1		free of charge 1 good water 1	
	by instalments 1	homework 1	bright 1
	producing 1 progress design 1 progressive 1	good smell 1	
blossom of youth 1			boring (-1)
punctuation 1 purposeful life 1	defence 1		big city (-1) big house 1
real life 1			
recognition 1	reasonable price 1		
	reconstruction 1 better agriculture 1		
refreshment 1	high technology 1 reinforced concrete 1		
		high expenses 1	easy to reconstruct
relief 1			
being together 1	hierarchy 1		heterogenous (-1)
	being active 1	retired (-1) reward 1 feelings 1	rich architecture 1
	right direction 1	rituals 1	deficiency (-1) density (-1) feeling death (-1) favourite 1 heavy (-1) depend on money (-1)
	having choice 1 being behind in technology (-1)		scattered land use (-1) scattered function in new architecture (-1)
		fate 1 science 1	second story 1
having car 1 sentiment 1		bad relation (-1) education 1	
	service manner 1		far from work (-1) sewage 1 shadow 1
shared benefits 1 sharing happiness 1	sharing 1 shopping with car 1		bad style (-1) short longevity (-1)
	bad management (-1)		

sincerity 1			short street 1 hard transport (-1)
		social relation 1	bad infrastructure (-1) small houses (-1)
		solid material 1	digestible 1 far distance (-1) far from the city (-1)
	solving shared problems 1 solving shortage of things 1 special group 1 specialization (-1)		bad location (-1)
	stable architecture 1	sport 1	
awareness 1	storage 1		far from Tehran 1
	durability 1 growth 1		
greeting 1		family number 1	
		dishonest gathering (-1)	
		governments' land 1	green belt 1
		familiar seller 1	artefact 1
	architects are people 1 government's control 1		symbol of city 1 symbol of defiance
	their information 1 government loan 1	technology 1	antiques 1
		time in city 1	tolerable 1 government built 1
		ancient culture 1 anarchy (-1)	good quality 1
trust 1	alone, it is impossible 1	all are neighbours 1	
	all work here 1 advise 1		uncontrollable 1 unique façade 1
unity 1	disorderly 1		
enjoyment 1	usefulness 1		good for elderly 1
vitality 1	enough experience 1		
	diversity 1		expensive (-1)
equal distribution 1		we did not have it (-1) addicted (-1)	weak ground (-1)
	accuracy 1	exogenous culture (-1)	exiting 1
	according to the needs 1	Western culture (-1)	academic area 1
working 1			

Table A.2.15 The compilation of the data under four dimensions such as: 'ultimate cause', 'subjective cause', 'objective cause' and 'formal cause'

ABBREVIATIONS

ACTAC	Association of Community Technical Aid Centres
ARSE	Architectural Radicals Students and Educators
AT	Appropriate Technology
AWARE	Association of Woodusers Against Rainforest Exploitation
CIAM	Congres Internationeaux d'Architercture Moderne
COWDUNG	Conventional Wisdom of the Dominant Group
DNA	Deoxyribonucleic Acid
DPCSD	The United Nations Department for Policy Coordination and Sustainable Development
FAN's	Feminist Arts News
GNP	The Gross National Product
ICSID	The International Council of the Society of Industrial Designers
IRD	Integral Rural Development
MDCs	More Developed Countries
MSC	The Mobarakeh Steel Complex
NGO	Non-Governmental Organization
NICs	Newly Industrialising Countries
RIBA	Royal Institute of British Architects
SCEPTRE	The Sheffield Centre for Product Development and Technological Resources
UNCED	The United Nations Conference on Environment and Development
UN	United Nations
VIDCO	The Village Development Committee
WCED	World Commission on Environment and Development

GLOSSARY

• Glossary of English Terms

The thesis has used frequently a number of concepts and terms which are thoroughly explained in the main context of the thesis and are briefed in the followings:

Abduction

It is a form of synthetic reasoning. It creates a novel composition. Design must use abductive (productive) inference so as to particularise. Science must employ inductive reasoning in order to generalise. Abductive merely suggests that something 'may be'. Abduction creates.

Bureaucracy

This is an organization that is designed to operate as much like a machine as possible. A Bureaucracy places more value on its own survival and stability than on performing its function satisfactorily (Ackoff, 1974).

Concept

Concepts are not iconic: they do not look like, sound like, and so on, what they signify. They are individuated sets of functional properties of objects or events that explain particular phenomena of communication. Herein, images connote structural properties, but concepts connote functional properties.

Culture

The term 'culture' is said by Wagner (1975) to be derived from "... the past participle of the Latin verb *colere*, to 'cultivate'." In this sense, the term 'culture' is mostly employed either to elitist connotation of creativity and evolution, or it is used in its historical context to refer to knowledge, productivity and way of living of a certain civilisation.

Deduction

It is a form of analytic reasoning. We usually conceive nature to be perpetually making deduction. We conceive that there are laws of nature and that cases arise under these laws. Deduction proves that something must be. Deduction predicts.

Description

Description is a phase for studying of, for example, patterned ways different subsocietal segments of a community use the city, its facilities and its services. The descriptive and explanatory stages are seen as a pre-analysis or preprocessing phase prior to the development of a system's approach and structural approach, which would come into play in the simulation stage of research and development and eventually in testing planning and policy proposals in the evaluation stage.

Design

In system view, a design consist of a 'system' of decisions. This means that it has properties that none of its parts do, and its parts acquire properties from the design that they would not otherwise have. Therefore, it is possible to have a feasible design none of whose elements, considered separately, are feasible. Moreover, design tells us about the society in which we live. It is a process of representation. It represents political, economic, cultural power and values. Designs, as cultural products, have meanings encoded within them which are decoded by producers, advertisers and consumers according to their own cultural codes.

Development

Development is a process in which individuals or societies increase their abilities and desires to satisfy their own needs and desires and those of others. It is much more a

matter of learning than of earning. It is better reflected in quality of life than in standard of living.

Endogenous

The adjective 'endogenous' is different from 'indigenous', because the first is more connected with the cultural identity of a society which clarifies itself by its nationhood, whereas the second term points to a society which characterises itself by its shared culture. Endogenous growth theory can be seen as a criticism of globalisation and endogenous development is all about growing from within.

Evaluation

Evaluation is a phase in which the simulation model is used to investigate, for example, the likely impacts on human activity of the implementation of various alternative plans and policies.

Evolution

In contrast to the animal which has an 'ambient' determined by its organization, Man himself creates his world, which is called 'human culture'. Among the presuppositions for its evolution are two factors: language and formation of concepts (models), which are closely related to each other. These are systems not of inherited but of freely created and traditions symbols. First of all, this explains the specificity of human history in contrast to biological evolution: tradition in contrast to hereditary mutations which is said to occur only over a long period of time. Secondly, physical trial-and-error, largely characteristic of animal behaviour, is replaced by mental experimentation, i.e. one with conceptual symbols. For this reason, true goal-directedness becomes possible.

Explanation

Explanation is a study of the factors that appear to regulate, for example, activity patterns which have been already described. In the explanatory type of investigation, the concern is with factors postulated as having an influence in shaping these activities.

Feedback Control

The basis of open-system model is the dynamic interaction of its components. The basis of the cybernetic model is the feedback cycle in which a desired value is maintained, a target is reached, etc. Cybernetic theory is based on feedback and information. In an open system increase of order and decrease of entropy is thermodynamically possible. The magnitude 'information' is defined by and expression formally identical with negative entropy. However, in a closed feedback mechanism information can only decrease, never increase. A feedback mechanism can 'reactively' reach a state of higher organization owing to 'learning'.

Feed-Forward Control

There is sometimes a 'non-adaptive control' where most of the effort goes into setting the system up correctly and reliably in advance, so that subsequent checking is not needed. For instance, a publisher checked the proofs of a book carefully, but once it was on the press no one proofread each copy. This is called 'feed-forward' or 'open-loop' control, because the controller has to predict in advance the exact action needed, and the loop is not closed by checking the results.

Growth

Growth is a change in size or number. It can be negative or positive. Organisms can increase or decrease in size, and populations can increase or decrease in number. Economic growth, therefore, refers either to a change in the size of an economy (e.g. its GNP) or a change in measure of its performance (e.g. per capita income). Growth usually occurs without choice in most biological systems. Physical or economic growth is necessary, if not sufficient, for development.

Homeorhesis

It is related to the systemic expression homeostasis, which is used in connection with systems which keep some variable at a stable value as time passes. Homeorhesis is used when what is stabilized is not a constant value but is a particular course of change

in time. If something happens to alter a homeorhetic system, the control mechanisms do not bring it back to where it was at the time the alteration occurred, but bring it back to where it would normally have got to at some later time.

Homeostasis

The conditions under which life, especially healthy life, can continue in the higher level of the hierarchy of the open-systems. A variation of one half degree centigrade in the body temperature is generally a sign of illness, and a permanent variation of five degrees is scarcely consistent with life. The inner economy of our body must contain an assembly of thermostats, automatic hydrogenion-concentration controls, governors, and the like, which would be adequate for a great chemical plant. These are what scientists know collectively as the homeostatic mechanism.

Image

'Images' are individuated sets of structural properties and the relationships between them to which subjects respond. Whereas, 'images' help us 'describe', concepts help us 'explain'. Herein, images connote structural properties, but concepts connote functional properties. Therefore, an image is an imitation or a reproduction or a similitude of something.

Inactivists

This is a personality type which is satisfied with the way things are and the way they are going. Its management philosophy is 'conservative' in that it seeks stability and survival. It tends to want what it can get rather than try to get what it wants, doing as little as possible when intervening in the course of events. Inactivists are 'problem absolvers' who try to ignore problems in the hope or expectation that they will go away or be taken care of in the natural course of events.

Indigenous

In indigenous societies, there exists a harmonious, socially plural and tolerant society whose structures are effectively catering for the sick, the homeless, the unemployed and the other disadvantaged.

Induction

It is a form of synthetic reasoning. It is where we generalize from a number of cases of which something is true, and infer that the something is true of a whole class. Induction shows that something 'actually is' operative. Induction evaluates.

Interactivists

They want to design a desirable future and invent ways of bringing it about. They believe we are capable of controlling a significant part of the future as well as its effects on us. They try to prevent, not merely prepare for, threats, and to 'create', not merely exploit, opportunities. Interactivists are not willing to settle for survival or growth. They seek 'self-development', 'self-realization', and 'self-control': an increased ability to design and control their own destinies. Interactivists are 'problem dissolvers' who try to change a system to remove the problem. They idealize rather than satisfice or optimize; that is, their objective is to move the system involved closer to its ultimately desired state, its ideal.

Knowledge

In a three-dimensional spiral the origin and end are in the opposite pole of a central axis. This is the axis of consciousness and its 'end' is not the second but the duplication. There is a third element keeping this dual picture in mind: 'relation' (process of production in artificial domain). By saying that, the distance between subject and object can be seen as knowledge.

Paradigm

A paradigm consists of a set of implicit rules for identifying a valid scientific problem, and for recognizing what would constitute a solution to it.

Pragmatic

Pragmatics should be used to cover all the different versions of what is a theory of sign behaviour. There are still various possible approaches, some more philosophical and

some more scientific, in so far as one can make such a distinction.

Preactivists

They believe that the future will be better than the present or the past. They want more than survival. They want to grow, to become better, larger, more affluent, more powerful, in a sense, to optimize. They plan for the future; they do not plan the future itself. Preactivists' management philosophy is 'liberal', in that they seek change within the system, but not change of the system or its environment. They are reformers, not revolutionaries, seeing planning as a sequence of discrete steps which terminate with acceptance or rejection of their plans. Preactivists are 'problem solvers' who try to do as well as possible, to optimize.

Reactivists

These prefer the previous state to the one they are currently in and they believe things are going from bad to worse. They are generally nostalgic about 'the good old days'. Their tendency is to return to the past making their management philosophy 'reactionary'. Their orientation is remedial, not aspirational. Reactivists are 'problem resolvers' who try to select a course of action that yields an outcome that is good enough that 'satisfices'. Their approach to problems is clinical.

Science

Peirce and Charles Morris had a common purpose in supplying science as a foundation for a theory of knowledge and both felt it could be done through the behavioural background specifically associated with language signs. Although science is legitimate in itself, the role and function of science and its application have become illegitimate and even dangerous because of the lack of a higher form of knowledge into which science could be integrated and the destruction of the sacred and spiritual value of nature. We naturally conceive of science as having three tasks: (1) the discovery of laws, which is accomplished by induction; (2) the discovery of causes, which is accomplished by hypothetic (abductive) inference; and (3) the prediction of effects, which is accomplished by deduction.

Semiotic

Semiotic is the name that was originally chosen by Peirce as well as later by John Locke, to categorise a particular scientific study of signs. Sometimes, it was referred to as 'semiosis' and sometimes it has become known as 'behavioural semiotic'.

Sign

People usually define a sign as a physical thing or event whose function is to indicate some other thing or event. The meaning of a sign may be inherent in its physical form and its context, as in the case of the height of a column of mercury in a thermometer as an indication of temperature, or the return of robins in the spring. Or, the meaning of a sign may be merely identified with its physical form as in the case of a hurricane signal or a quarantine flag. But in either case, the meaning of the sign may be ascertained by sensory means. The fact that thing may be both a symbol (in one context) and a sign (in another context) has led to confusion and misunderstanding. Black clouds are a sign of rain and 'rain' is a symbol for rain, and certainly it is true that in describing rain it is only a sign by theory of meaning.

Simulation

Simulation is the development of a model capable of reproducing, for example, activity patterns. Simulation encounters formidable problems in projecting activities into the future. Even simply redistributing the present population to a rearranged spatial structure of built environment poses some kinds of uncertainties in connection with moving behaviour.

Symbols

A 'symbol' is something that stands for something else. It may do this as the result of an association, a convention, or even an accident. A 'symbol' is the result of a cognitive process whereby an object acquires a connotation beyond its instrumental use. An 'object' may be an environment or a person as well as a material artifact (a product). Its meanings are derived from what an observer imputes to them. A 'sign' in contrast,

is a conventional figure or device that stands for something else in a literal rather than an abstract sense. The symbol is also known as the basic unit of all human behaviour and civilization. Human behaviour is symbolic behaviour; symbolic behaviour is human behaviour. The symbol is the universe of humanity. A symbol may be defined as a thing the value or meaning of which is acknowledged by those who use it.

Tradition

Tradition is as a significant source for realizing the design both as a problem solving process and a creative action. Tradition is always young, fresh and new; not a defence of the old, the ancient, or the antique. A definition from The Oxford English Dictionary refers to a significant point in the meaning of tradition which emphasis on the principle of transmission and indicates: "Tradition (Lat. tradition, -onem): 4. The action of transmitting or 'handing down', or fact of being handed down, from one to another, or from generation to generation; transmission of statements, beliefs, rules, customs, or the like, esp. by word of mouth or by practice without writing."

Transformation

Time and change appear to be increasingly important dimensions for explaining transformation. Biological theories have advanced beyond the simple finite informational concept of cybernetics towards 'structured information' or symbolic concepts whose models are to be found in structural linguistics, anthropology, and mathematics. It appears to be precisely through the transmission of such non-deterministic but 'unfoldable' symbolic structures that living organisms retain their stable forms yet participate in a gradual evolution.

Glossary of Non-English terms (Farsi)

Bonyad-e Maskan	Housing Foundation: a revolutionary organization parallel to Ministry of Housing and Urban Planning in Iran
Giveh	Light cotton summer shoe
Gozar	Footpath
Jihad-e Daneshgahi	It is one of the new Islamic organizations which was established in universities after the Islamic Revolution of Iran to accelerate the process of their qualifications.
Jihad-e Sazandegi	Construction Crusade: parallel to Ministry of Agriculture which is a new organization established since the Islamic Revolution of Iran to deal with rural development programmes.
Maydaan	Square
Saqakhaneh	A public drinking fountain
Sepah-e Pashdaran	Guardian Corps: a revolutionary organization parallel to the Army in Iran
Shi'ite	About 99.56 per cent of all Iranians are Muslims; 93 per cent are Shi'ite. Most of the ethnic minorities, however, including Kurds, Baluchi, Turks, and Arabs, are Sunnites. Shi'ism is based on the doctrine of Imamate. According to this doctrine, legitimate rule belonged to the Imams who were descendants of Imam Ali (pbuh), the successor of the Prophet Mohammed (pbuh) and the first Shi'ite Imam. The Shi'ite believes in the continuation of divine guidance through the Imams whom they considered as both political and religious leaders. After the death of the fourth Imam, the era of 'general agency' (Velayet-e Ammeh) began in which the Ulama, as vicars of the Imam, had the right and duty to guide the community of believers.